A DISSERTATION ON

" A STUDY ON CLINICOPATHOLOGY OF FISTULA IN ANO IN RGGGH "

Dissertation submitted to

THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY

CHENNAI

With partial fulfilment of the regulations

for the award of the degree

M.S.(General Surgery)

BRANCH I

INSTITUTE OF GENERAL SURGERY,

MADRAS MEDICAL COLLEGE,

CHENNAI.

APRIL – 2016

CERTIFICATE

This is certify that the dissertation entitled " A STUDY ON CLINICOPATHOLOGY OF FISTULO IN ANO IN RGGGH" is a bonafide original work of **Dr. M. EMIL PHINEHAS.,** in partial fulfilment of the requirement for M.S. branch – I (General surgery) Examination of the Tamil Nadu Dr.M.G.R. Medical University to be held in APRIL, 2016 under my guidance and supervision in 2014 – 2015.

Prof.Dr.P.RAGUMANI. M.S
Guide and Supervisor
Director and Professor
Institute of General Surgery
Madras Medical College,
Rajiv Gandhi Government General Hospital
Chennai - 600003

Prof.Dr.P.RAGUMANI. M.S
Director and Professor
Institute of General Surgery
Madras Medical College,
Rajiv Gandhi Government General Hospital
Chennai - 600003

Dr. VIMALA, M.D,

Dean

Madras Medical College & Rajiv Gandhi Government General Hospital,

Chennai- 600003.

DECLARATION

I hereby solemnly declare that the dissertation titled " A STUDY ON CLINICOPATHOLOGY OF FISTULO IN ANO IN RGGGH" is done by me at Madras medical college & Rajiv Gandhi Govt. General Hospital, Chennai during 2014 – 2015 under guidance and supervision of Prof.Dr.P.RAGUMANI, M.S. the dissertation is submitted to The Tamil Nadu Dr.M.G.R Medical University, Chennai towards the partial fulfilment of requirements for the award of M.S. Degree (Branch – I) in General surgery.

Place :

Date :

DR. M. EMIL PHINEHAS,
Post Graduate student,
M.S General surgery
Institute of General surgery
Madras Medical College,
Chennai – 3.

ACKNOWLEDGEMENT

I express my heartful gratitude to the Dean, **Dr.VIMALA** M. D., Madras medical college & Rajiv Gandhi Government General Hospital, Chennai – 3 for permitting me to do this study.

I am deeply indebed to **Prof. Dr.P.RAGUNMANI , M.S.,** Director & Professor, Institute of General Surgery, Madras Medical College & Rajiv Gandhi Government General Hospital for his support and guidance.

I am very grateful to **Prof.Dr.P.RAGUMANI ,M.S,** Professor of Surgery, Institute of General Surgery and my Assistant Professor

Madras Medical College & Rajiv Gandhi Government Hospital who guided and trimmed my work throughtout the period of my study.

I am extremely thankful to all the members of the INSTITUTIONAL ETHICAL COMMITTEE for giving approval for my study. I also thank all the patients who were part of the study and my Professional colleagues for their support and criticisms.

ABSTRACT

BACKGROUND

While the majority of fistula in ano are anatomically simple and easy to treat, a significant fistula are high or anatomically complex and the leave the potential to become a major management problem.

METHODS:

Seventy five patients undergone fistuloa surgery were studied retrospectively and prospectively with standardized purposive sampling method.

RESULTS:

The Descriptive and Observational study were carried out to determine the clinicopathology of perianal fistula including the various modalities of treatment and its efficacy. Seventy five patients fulfilling the inclusion criteria from surgery department were studied during the period of August 2014 to July 2015. Fistulas were common in 30-39age group. Male to female ratio is 3:1. Diabetes was the predominant factor (13.3%). All the patients presented with perianal discomfort with more than 50% of patients presented with perianal discharge . MRI found to be golden investigation of choice in all types of fistula in ano.

Fistulotomy was the most commonly performed procedure for low anal fistula (68%) . Seton was preferred in high anal fistula with external sphincter involvement. Regarding etiology, Tuberculosis was seen in 13% of patients. Most common complications being anal incontinence seen in 16 %. 10.6% patients recurred. Fistulotomy found to have least complication rates . Seton found to have high complication rates.

CONCLUSION:

Proper pre operative evaluation and planning of treatment is essential to prevent complications. Fistulotomy is preferred for low anal fistulas. Proper management protocols to be established.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

TB	- -	Tuberculosis
HIV	- -	Human Immunodeficiency Virus
USG	- -	Ultrasonogram
CECT	- -	Contrast Enhanced Computed Tomography
ADA	- -	Adenosine De Aminase
CMI	- -	Cell Mediated Immunity
MRI	- -	Magnetic Resonance Imaging
LIFT	- -	Ligation of Intersphincteric Fistula Tract
VAAFT	- -	Video Assisted Anal Fistula Treatment

CHAPTER 1

INTRODUCTION

INTRODUCTION

1. BACKGROUND

Fistula in ano form a good majority of treatable benign lesions of rectum and anal canal. 90% or so of these cases are end results of crypto glandular infection. Anal fistulas are considered one of the commonest cause for a persistent seropurulent discharge that irritates the skin in the neighbourhood and causes discomfort. Fistula in ano is seen quite frequently and in frequent virtually mirrors perianal and perirectal suppuration.

It is an abnormal communication lined by granulation tissue between the anal canal and skin which causes chronic inflammatory response. Most commonly these fistulae develop following an anal abscesses secondary to infection of anal glands.

There has been a lot of progress in the understanding of the anatomy of the anal canal and the mechanism of continence of rectum and anal canal. This has allowed the surgeon to deal with keeping the spastic anorectal ring intact without interfering with the continence and eradicating the disease.

An anal fistula is essentially a painless condition,though discharge ceases temporarily and pus accumulates to form recurrent abscesses. Pain is experienced till the abscess ruptures which gives immediate relief. Soreness and itching of

perianal skin however are common due to pruritus resulting from the moist swollen condition of the skin.

The traditional method has consisted in laying open the fistulous tract in part or whole ,in one or more stages and letting the wound heal by secondary intention.

Fistula in ano rarely heals spontaneously and requires surgical therapy to achieve a cure. Surgical techniques like fistulotomy, fistulectomy, primary closure after excision of tract and staged operations have rendered the postoperative period uneventful, short and steep fall in recurrence rate. A careful discussion with the patient regarding the options and potential risks must be performed preoperatively.

It has been said that more surgeons reputation have been impugned because of the consequences of fistula operations than from any other operative procedures. Complications of fistula surgery are myriad and include faecal soiling,mucus discharge,varying degrees of incontinence and recurrent abscess and fistula. Clearly the surgeon who is fortunate enough to have the first opportunity to treat the patient is the one most likely to effect a cure,to limit morbidity and to minimize disability.

In this dissertation, an attempt is made to study the presenting symptoms,the findings on clinical examination,various surgical procedures,post operative recovery and recurrence

1.2 AIMS AND OBJECTIVES

The purpose of the study is to

1. To study the aetiological factors and clinical presentations of fistula in ano.
2. To determine the predictive accuracy of Goodsall's rule in relation to type of fistula treated.
3. To study the various methods of management of fistula in ano and its outcome.
4. To study the complications and recurrences if any.

CHAPTER 2

REVIEW OF LITERATURE

REVIEW OF LITERATURE

2.1 EMBROYOLOGY

The expanded terminal part of the hindgut is called the Cloaca,which is an endodermal lined cavity that is in contact with the surface ectoderm at the cloacal membrane. This membrane is composed of endoderm of the cloaca and the ectoderm of the cloacal membrane.

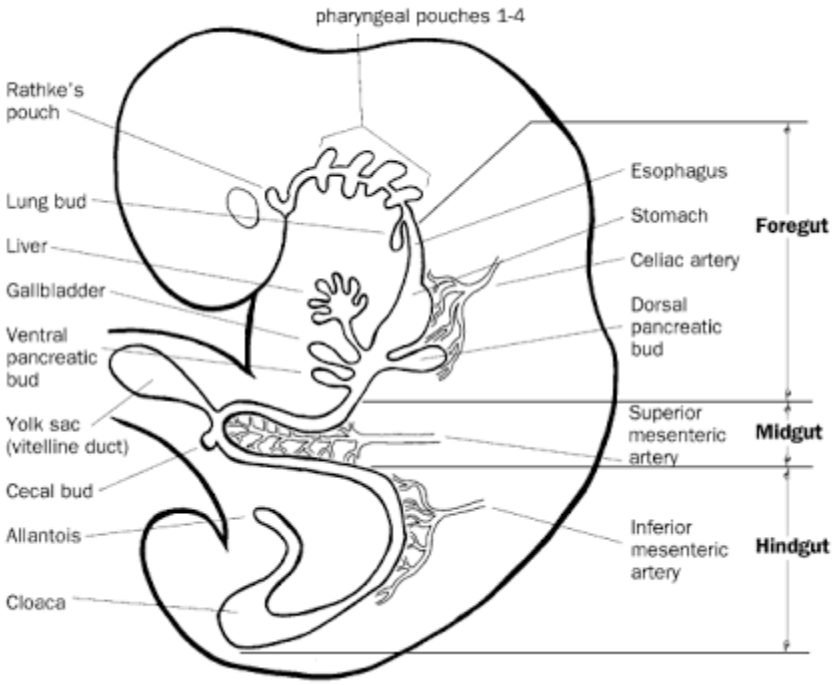


Fig.1 Shows Embroyological anatomy of fetus at 5th week of gestation. Shows the gross development of hindgut with its supplying inferior mesenteric artery

The urorectal septum separates the cloaca into dorsal and ventral parts. When the urorectal septum approaches the cloacal membrane,it produces some forklike extensions that produces infoldings in the lateral wall of the cloaca. These folds grow toward each other and fuse to divide the cloaca into a ventral urogenital sinus and a dorsal part which forms the cranial part of the anal canal and rectum.By the seventh week of gestation,the urorectal septum fuses with the cloacal membrane to form the ventral urogenital sinus and dorsal anorectal membrane. The area of fusion of the urorectal septum with the cloacal membrane is represented in adults by the perineal body. This tendinous node in the perineum is the site of attachment for perineal muscles. This urorectal septum also divides the cloacal sphincter into anterior and posterior parts. The posterior part develops into the external anal sphincter and the anterior part develops into superficial transverse perinei muscle,bulbospongiosus and ischiocavernosus. By the end of eighth week, the anal membrane ruptures,thus bringing the distal digestive tract to communicate with the exterior amniotic cavity.

The upper two thirds of the anal canal is derived from the hindgut, whereas the distal one third is derived from the proctodeum. This junction is marked by the irregular pectinate or dentate line. This site represents the previous site of anal membrane. The anocutaneous line or white line of Hilton, which is approximately 2 cm from the anal verge is the site of epithelial transformation. Above this line,the

epithelium is columnar and is derived from mesenchyme whereas the epithelium below this line is derived from surface ectoderm and is lined by stratified squamous epithelium which is continuous with the skin of the perineum.

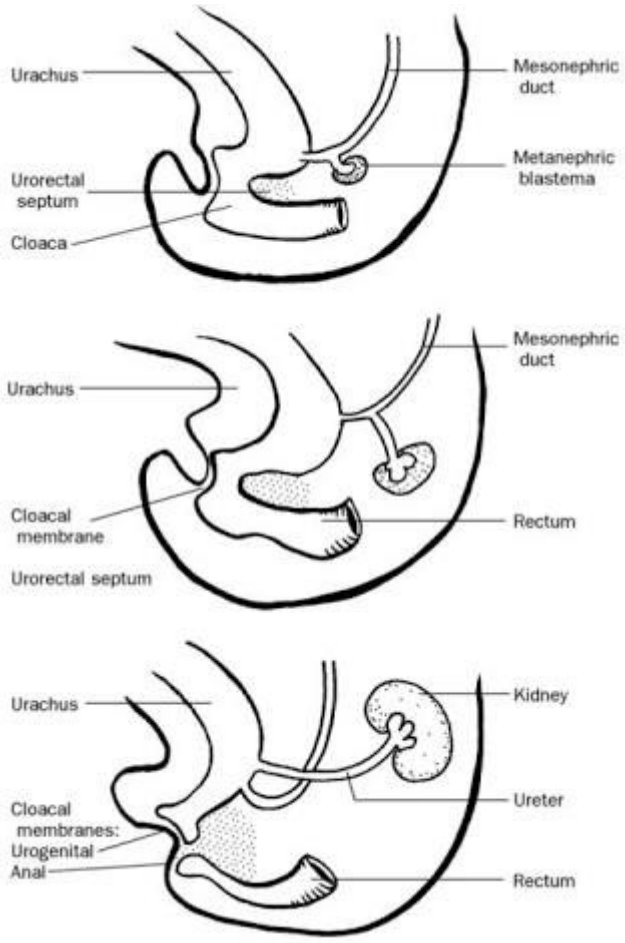


Fig.2 shows the development of hindgut and proctodeum at 7weeks of gestation.the urorectal septum divides the cloaca into dorsal anal membrane and ventral urogenital sinus.

Since the rectum and upper two thirds of the anal canal are derived from the hindgut, it is supplied by the superior rectal artery,a branch of the inferior mesenteric artery and drained by the inferior mesenteric vein. It is controlled by the autonomic nervous system. Lymphatic drainage is through the superior rectal nodes and to the inferior mesenteric group of nodes.

Since the lower one third of the anal canal is derived from the surface ectoderm, it is supplied by the inferior rectal artery, a branch of the internal pudendal artery and drained by the internal pudendal vein. Lymphatic drainage is through the superficial inguinal nodes and to the iliac group of nodes. It is sensitive to pain, temperature and pressure.

2.2 ANATOMY OF RECTUM

INTRODUCTION

Rectum is a hollow muscular tube, which helps in defecation and continence mechanism in combination with anal canal. Above , it is continuous with the sigmoid colon at the level of third sacral vertebra and terminates at the upper end of the anal canal after piercing the pelvic diaphragm. Rectum follows the sacrococcygeal concavity, forming the sacral flexure. At the level of the upper end of the anal canal the rectum curves posteriorly forming the perineal flexure of the rectum.

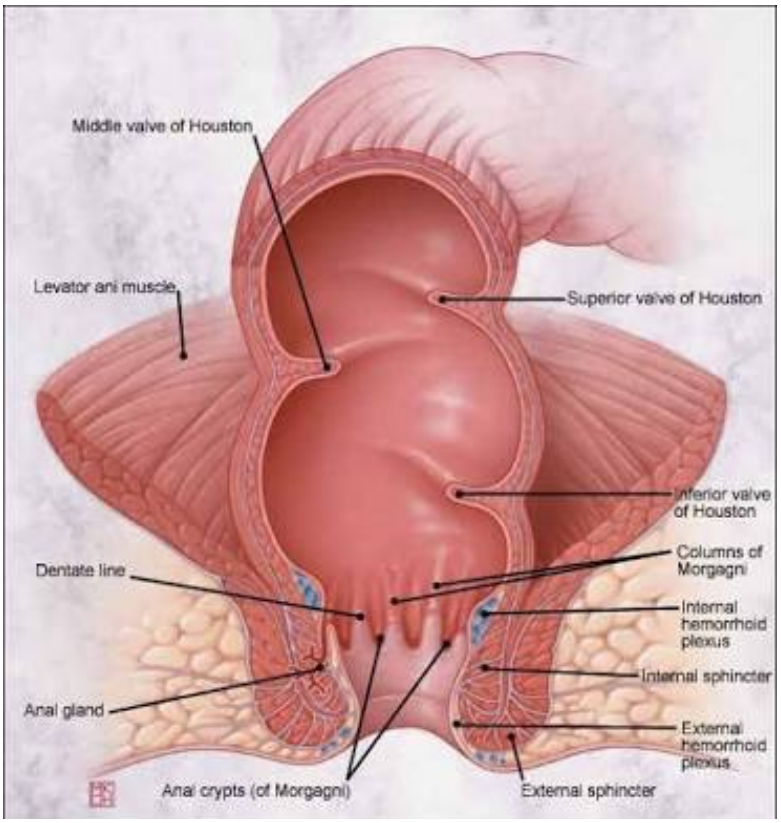


Fig.3 Shows the internal anatomy of rectum and anal canal

The rectum has three lateral curves. Lower curve is convex to the right, the middle curve which is the most prominent is convex to the left and the upper curve is convex to the right. The most inferior part of the rectum is dilated when compared to the upper part to form the rectal ampulla.

Rudimentary sacculations affecting the sides of the rectum ,along the concavities of the curves horizontal rectal valves project into the interior of the rectum and support the weight of the faeces.

The rectum differs from the sigmoid colon in having no taenia, sacculations, appendices epiploicae or mesentry. The taenia blend approximately 6 cms above the recto sigmoid junction and forms the longitudinal encircling layer of muscle. This longitudinal muscle layer of the rectum forms the musculus rectourethralis and also rectococcygeal muscle.

The rectum is covered by peritoneum in its upper third on the anterior and lateral aspects. The peritoneum covers the middle third only in its anterior aspect. The peritoneum is reflected superiorly on to the bladder in males to form the recto-vesical pouch or onto to the posterior vaginal wall in females to form rectouterine pouch (pouch of Douglas)

Internally, the rectum has three permanent semilunar transverse or horizontal Folds (Houston's valves) which is most prominent on rectal distension. The

superior fold is at the beginning of the rectum and occasionally encircles the rectal lumen. The middle fold, which is the most constant lies on the right side of the rectal lumen and above the rectal ampulla, just below anterior peritoneal reflection. The inferior fold is to the left and lies approximately 2.5cms below the middle fold.

The rectum also has longitudinal temporary folds,more in its lower part which gets disappeared on rectal distention.

MESORECTUM

It is enclosed by the mesorectal fascia, also known as the visceral fascia of the mesorectum. The mesorectum and mesorectal fascia is surrounded by loose areolar tissue. Laterally the fascia encircles the mesorectum to become a thick condensation anteriorly. This thick fascial condensation is called Denonvillier's fascia or rectoprostatic fascia in males, fascia of rectovaginal septum in females.

Posteriorly the mesorectal fascia condenses to form the Waldeyer's fascia, anterior to the coccyx and lower two sacral vertebra. These fascial layers are surgically important as they form a barrier to malignant invasion.

Mesorectum contains loose adipose tissues, superior rectal artery and its branches, superior rectal vein and its tributaries, superior rectal nodes and nerve plexuses.

Branches of the inferior hypogastric plexuses and the branches of the middle rectal artery runs into the mesorectum antero laterally forming fascial pillars called the lateral rectal ligaments.

RELATIONS OF THE RECTUM

Posteriorly the rectum is related to lower three sacral vertebra, coccyx, sacral sympathetic chain and median sacral vessels. Laterally, above the peritoneal reflection, it is related to the pararectal fossa and below the peritoneal reflection it is related to pyriformis muscle, lateral sacral vessels and levator ani muscle. Anteriorly, above the peritoneal reflection, is related to sigmoid colon or ileum, or base of the bladder, cervix and upper vagina. Anteriorly, below the peritoneal reflection it is related to base of the bladder, prostate , vas deferens, seminalvesicle and terminal ureters in males, cervix and upper vagina in females.

VASCULAR SUPPLY

ARTERIAL SUPLLY

The upper two third the rectum is supplied by the superior rectal artery, which is the principle branch of the inferior esenteric artery. The superior rectal artery initially lies in the sigmoid mesentry,then its terminal branches enters the mesorectum to supply the upper two thirds. The terminal branches anastamose with the ascending branches of the inferior rectal artery. The middle rectal artery arises

from the internal iliac artery from its anterior division and enters the mesorectum through the lateral rectal ligaments. The inferior rectal artery is the terminal branch of the internal pudendal artery and supplies the lower third of the rectum.

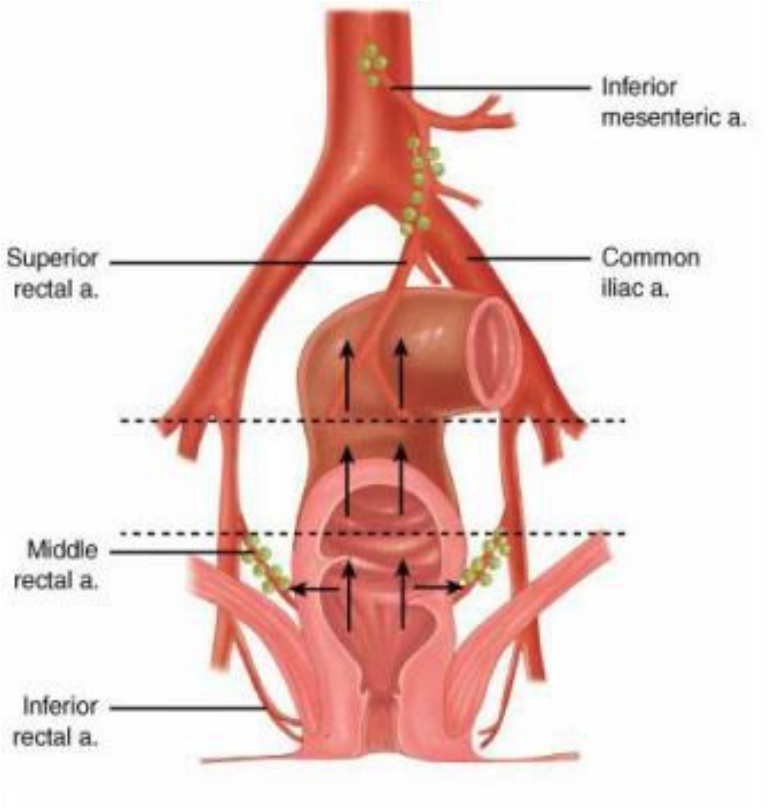


Fig.4 Shows the arterial supply of the rectum

VENOUS DRAINAGE

The rectal venous plexus contains an internal part,which lies in the subepithelial plane and an external part which lies outside the muscular wall. There is a rich anastamosis between the the internal and external venous plexus. The internal plexus drains mainly to the superior rectal vein. The upper portion of the external plexus drains to the superior rectal vein and then to the inferior mesenteric

vein,whereas the inferior portion of the external plexus drains into the inferior rectal vein and then to the internal pudendal vein.

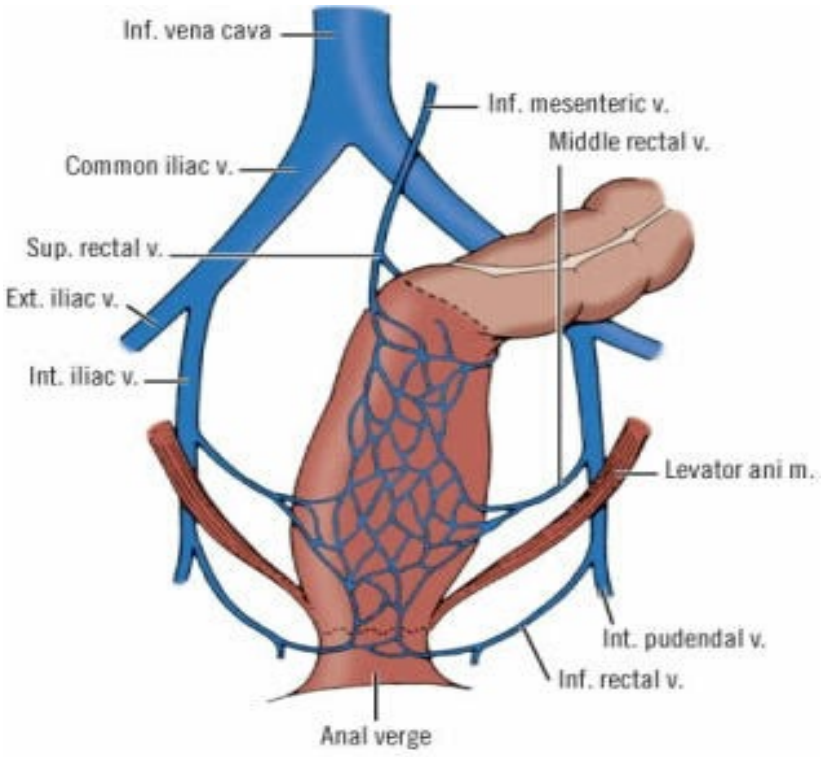


Fig.5 Shows the venous drainage of the rectum and anal canal

LYMPHATICS

Rectum and anal canal upto dentate line drains into epirectal nodes in the mesorectum,close to the rectal wall. The pararectal nodes lies within the mesorectum away from the rectal wall. The lymphatics then drains in the nodes along the superior rectal vessels to get drained in the inferior mesenteric group of nodes.

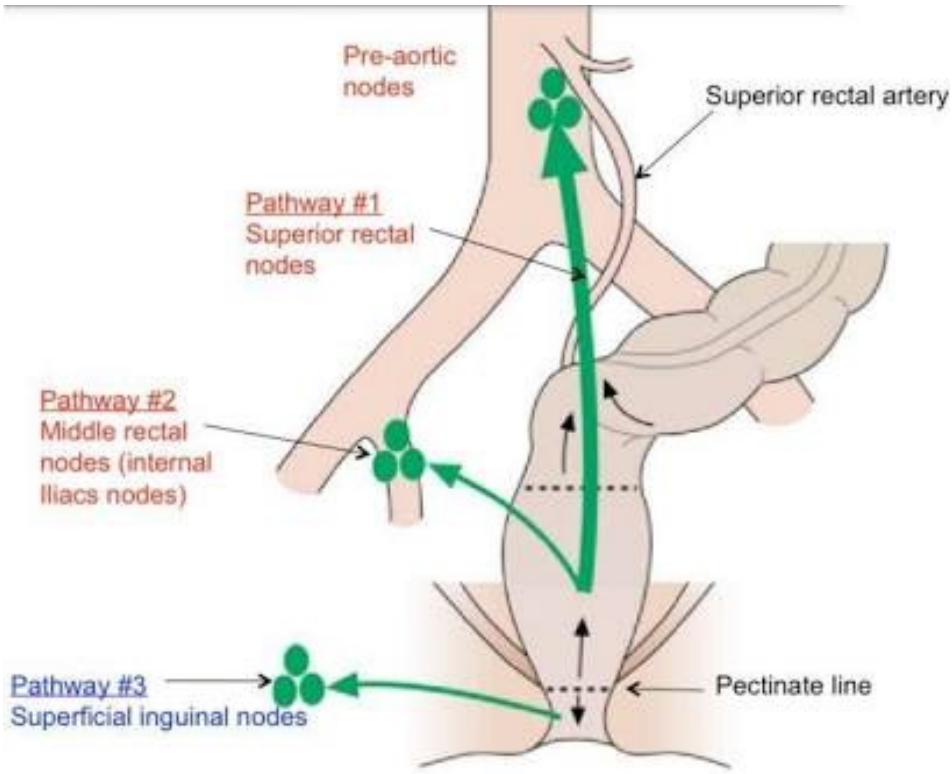


Fig 6. Shows the lymphatic drainage of rectum and anal canal

NERVE SUPPLY

The rectum is innervated by both sympathetic and parasympathetic plexus via the inferior mesenteric plexus. Small contribution is also from the inferior hypogastric plexus.

2.3 ANATOMY OF ANAL CANAL

INTRODUCTION

Anal canal is the most distal portion of the alimentary canal. It extends for a distance of about 4cms from the anorectal ring to the hairy skin of the anal verge. Anal canal is angulated in relation to the rectum due to the pull of the sling like puborectalis muscle which produces the anorectal angle of approximately 120. Pigmentation of skin around the anal verge demarcates the extent of external anal sphincter. Characteristic puckering of the skin around the anal verge,caused by the penetrating fibres of the conjoint longitudinal layer, makes a useful landmark for the identification of the anal verge. Anal canal consists of inner lining epithelium, a vascular sub-epithelium, internal and external anal sphincters, and fibromuscular supporting tissues. Anal canal is generally longer in men than in women. At rest it forms a oval slit in the antero-posterior plane due to the arrangements of the external anal sphincters. Together with the pelvic floor structures, its musculature contribute significantly to the regulation of continence and defecation.

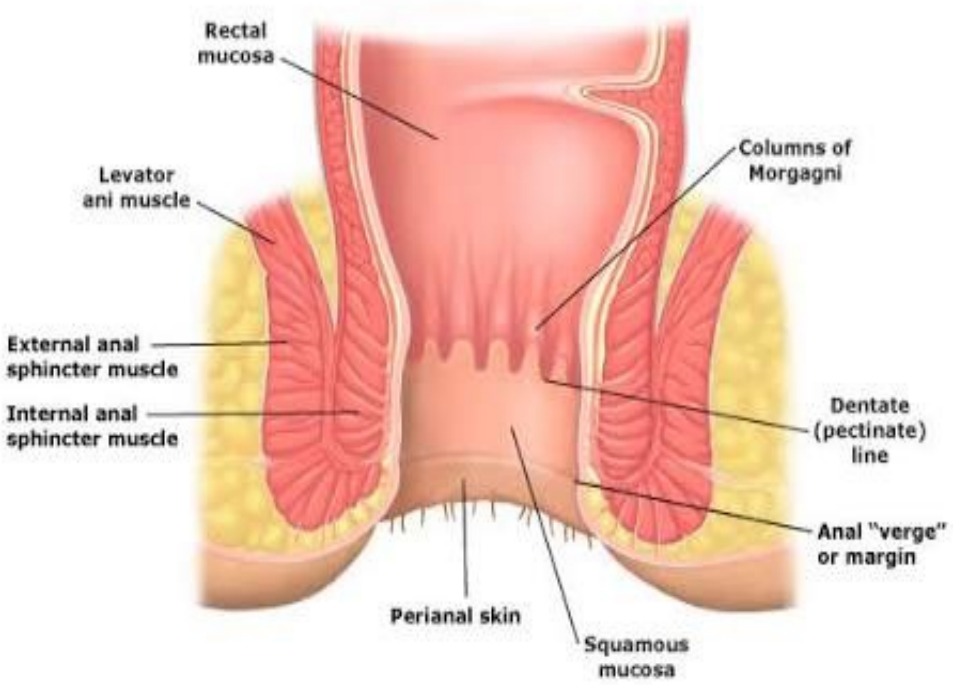


Fig 7. Shows the internal anatomy of anal canal

RELATIONS

Anal canal is related posteriorly to the coccyx and anococcygeal raphae, laterally to the ischiorectal fossa and its contents bilaterally. Anteriorly it is related to perineal body and vagina in females and the urethra in males

LINING OF THE ANAL CANAL

The mucosa proximal to the characteristically serrated dentate or pectinate line is pinkish and is lined by columnar epithelium which contains secretary and absorptive cells with numerous glands, whereas the mucosa distal to the dentate line is paler and lined by stratified non keratinized squamous epithelium without

hair follicles, sebaceous and sweat glands. However the change between the two types of epithelium is not abrupt, and the mucosa of the so called transitional zone, which lies immediately proximal to the dentate line, consist of layers of cuboidal cells interspersed with tongues of purplish coloured columnar epithelium.

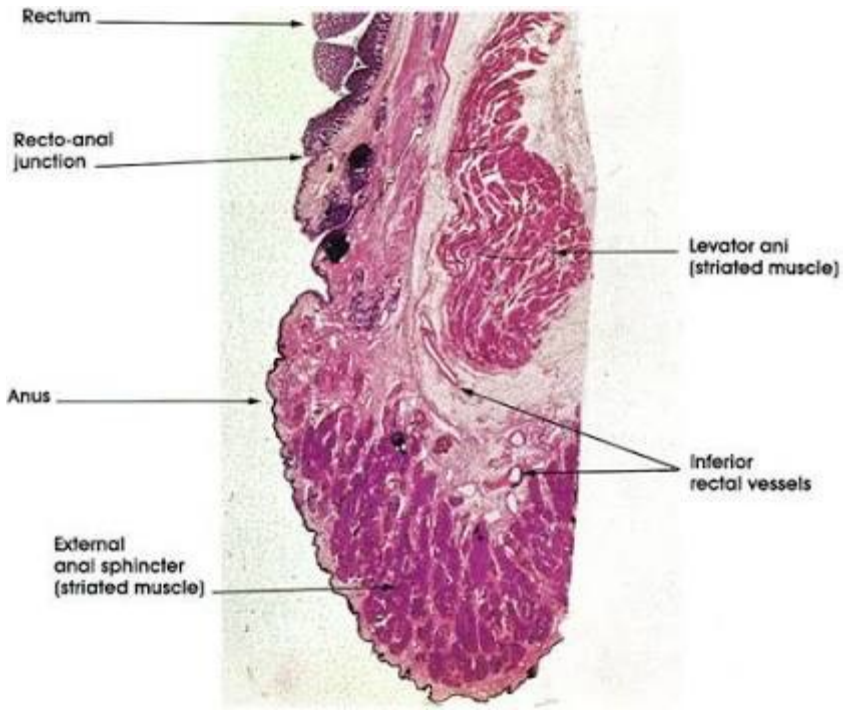


Fig 8. Shows the microanatomy of the anal canal

The proximal mucosa is corrugated into a series of 12 to 14 anal columns of Morgagni which is prominent in children than adults. Each anal columns of Morgagni contains a terminal radical of superior rectal artery and vein. These terminal vascular pedicles are largest in the right anterior, left lateral and right posterior quadrant. In these quadrants , the sub epithelial tissue expands into three

anal cushions , which seals the anal canal to maintain continence to fluid and flatus.

The lower ends of the anal columns of Morgagni has small folds called anal valves and between these anal valves are small recesses called anal sinuses. Between each folds of the anal columns of Morgagni are the anal crypts. Anal glands which are variable in number traverse the submucosa to enter the internal anal sphincter to terminate in the intersphincteric plane , opens into these crypts. Thus, infection of these cryptoglandular structures may result in fistulas that can be expected to communicate with the dentate line area. At the anal verge the lining acquires the characteristics of the normal skin, which is lined by stratified squamous keratinized epithelium with its apocrine glands and hair follicles and contains multiple somatic nerve endings. The submucosa in this region has numerous arterial and venous plexuses and also dense connective tissues when compared to the upper part of the anal canal.

MUSCULATURE OF THE ANAL CANAL

The anal canal musculature forms the terminal muscular channel of the gastrointestinal tract. The anal canal is surrounded by the internal anal sphincter and the external anal sphincter with the longitudinal muscular coat inbetween.

INTERNAL ANAL SPHINCTER

Internal anal sphincter is a well defined ring, which is the continuation of the smooth circular muscle layer of the rectum. It is approximately 2.5 to 3.5 mm thick. It is usually thinner in females and becomes thicker with age. It terminates approximately 1.5 cms below the dentate or pectinate line, at the junction of the superficial and subcutaneous component of the external anal sphincter. Supplied by the terminal branches of the superior rectal vessels and also from the branches of the inferior rectal vessel. Innervated by both sympathetic and parasympathetic system. Sympathetic supply is from the L4 and L5 segments, which is distributed through the inferior hypogastric plexuses. Stimulation of the sympathetic system causes contraction of the internal anal sphincter. Parasympathetic supply is from the S2, S3 and S4 segment which is distributed through the inferior hypogastric plexuses and causes relaxation of the sphincter.

EXTERNAL ANAL SPHINCTER

It is a continuous sheet of striated muscle, composed of type I slow twitch skeletal muscles constituting the pelvic floor. The external anal sphincter is elliptical and engulfs the anal canal and the internal anal sphincter, beyond which it terminates in the subcutaneous portion. Although the external sphincter is divided into superficial, deep and subcutaneous portion, the superficial and deep

portion constitute a single muscular unit which is continuous superiorly with the puborectalis and levator ani muscle.

The external anal sphincter is supplied by the terminal branches of the inferior rectal artery and also from the median sacral artery. Innervated by the inferior rectal branch of pudendal nerve.

CONJOINT LONGITUDUNAL COAT

It is situated between the internal and external anal sphincter. It contains fibromuscular layer, the conjoint longitudinal coat and the intersphincteric space with its connective tissue components. It has a muscular and fibroelastic components. The muscular component lies between the internal and external anal sphincter and terminates just above the termination of the internal sphincter. The fibroelastic component penetrates the internal and external anal sphincter to get inserted into the anal verge and the perineal skin.

2.4 PHYSIOLOGY OF DEFECATION

Defecation is complex coordinated mechanism, which involves colonic mass movements, increased intra-abdominal and rectal pressure and relaxation of the pelvic floor. Distention of the rectum with feces initiates reflex contractions of its musculature and the urge to defecate. The ability to control defecation depends upon the coordinated functions of the sensory and motor functions of the anus, the compliance, tone,the muscular activities of the pelvic floor and the consistency, volume and timing of the colonic movements.

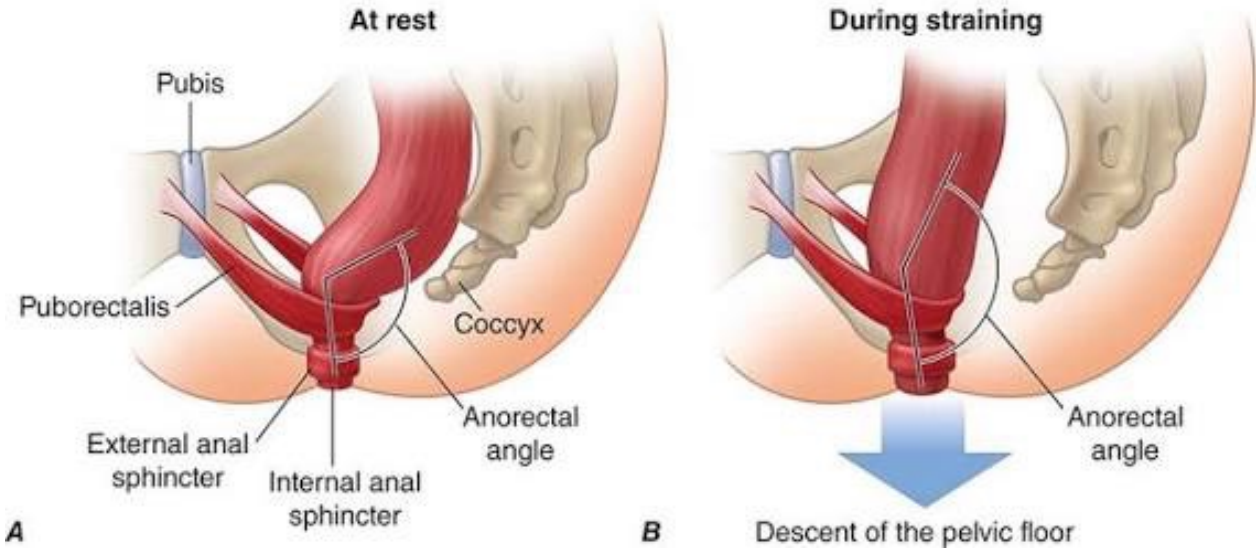


Fig.9(A) Shows normal anorectal angle at rest , Fig.9(B) Shows descent of the pelvic diaphragm and increase in the anorectal angle during defecation.

The internal anal sphincter, which is involuntary is supplied by both sympathetic and parasympathetic system. Sympathetic supply is excitatory, whereas the parasympathetic supply is inhibitory. The internal sphincter relaxes when the rectum is distended.

The external anal sphincter, under the voluntary control is supplied by somatic nerves. This sphincter is maintained in a state of tonic contraction, and any moderate distention of the rectum further increases the force of its contraction.The resting pressure averages 90 cmH2O and is lower in women and older individuals than in men and younger patients. Squeeze pressure, which is maintained by the tonic contraction of the external anal sphincter and puborectalis muscle, doubles the intra-anal canal resting pressure. This squeeze pressure prevents leakage on presentation of the rectal contents into the proximal anal canal.

The urge to defecate occurs when the rectal pressure is around 18mmHg, and when this pressure exceeds 55mmHg, the internal and external anal sphincter relaxes and there is a reflex propulsion of contents of the rectum. This is why reflex evacuation of the rectum occurs even in the setting of spinal injury.

Normally the anorectal angle is approximately 120 and is mainly maintained by the anterior pull of the sling like puborectalis muscle. While straining, the abdominal muscles contract, the pelvic floor descends to about 1-3 cm and the puborectalis muscle relaxes. Thus the anorectal angle is reduced to 15 or less.

Distension of the rectum causes a reflex relaxation of the internal sphincter (recto anal inhibitory reflex) that allows the contents of the rectum to make contact with the anal canal for discrimination. This sampling reflex allows the sensory epithelium of the anal canal to distinguish solid stool from liquid stool and gas. If defecation does not occurs the rectum relaxes and the urge to defecate vanishes (The accomadation response).

When the stomach gets distended with food , the colonic contraction increases and there is an urge to defecate. This is more commonly seen in children and is augmented by the action of gastrin on colon. This is called as the gastro colic reflex.

2.5 ANORECTAL ABSCESS

Although there are many causes of anorectal suppuration like Crohn's disease and hidraniditis suppurativa, by far the most common is the non specific suppuration of cryptoglandular origin. The pathophysiology of anorectal abscess and fistula in ano are the same, with the anorectal suppuration representing the acute phase of the disease whereas the fistula in ano represents its chronic form. The diagnosis and management depends not only on the understanding of the etiopathogenesis of the disease but also the understanding of relevant surgical anatomy and its route of spread. Misunderstood surgical anatomy leads to surgical mid adventures which can lead to inadequate evacuation of the abscess and at sometimes leads to permanent sphincter damage.

The dentate line represents the embryological landmark between the hindgut and proctodeum. There are approximately 8-10 anal glands which are tubular in structure ,lined by stratified squamous epithelium with direct opening into the base of anal crypt. They penetrates the submucosa and internal anal sphincter to reach the intersphincteric space. Parks found that two thirds of the anal glands send branches to the internal sphincter of which, one half sends branches to the intersphincteric plane to end in the longitudinal muscle layer. No branches were found in the external sphincter.

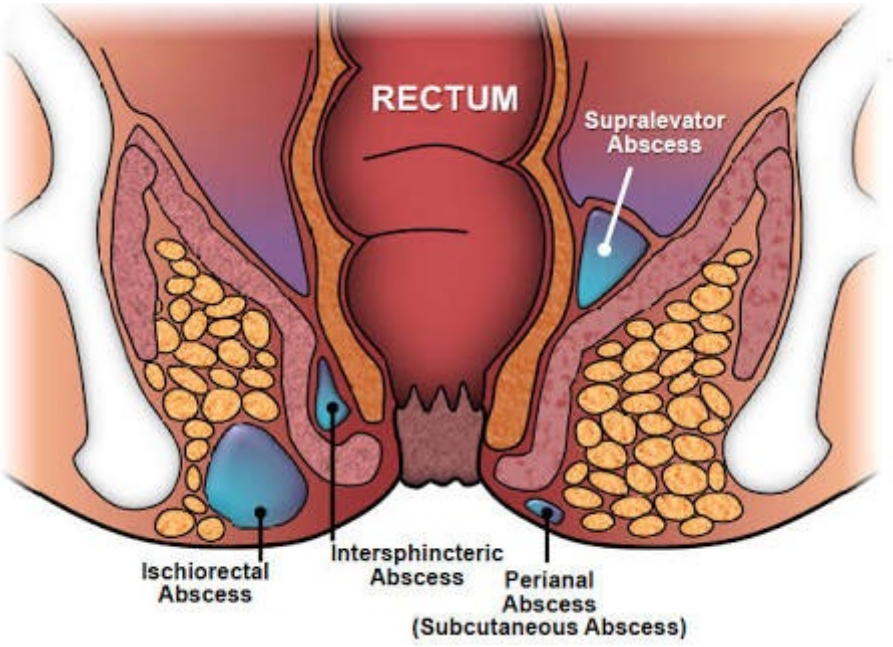


Fig.10 Shows different potential sites of anorectal abscess formation

The anatomic structure of the pelvis and perianal region provides many potential spaces which are normally filled by fat and loose areolar tissue. These potential spaces are the sites of anorectal infection,which can present as well defines abscesses. The intersphincteric space lie between the internal and external sphincter ,and it contains the conjoint longitudinal muscle coat, which theoretically can help to spread the infection to perianal and supralevator spaces.

The supralevator space lies above the levator ani muscle and below the pelvic peritoneum and is surrounded by pelvic sidewall. The perianal space is a potential space which lies around the anal verge and communicates superiorly with intersphincteric space and surrounding buttock fat. The ischiorectal space is a

horseshoe shaped fat filled space which is bounded superiorly by the levator ani muscle,medially by the external anal sphincter, laterally by the obturator internus, obturator fascia and ischium and inferiorly the the skin of the perineum. Both ischiorectal space communicates with each other posteriorly behind the anal canal through the so called post anal space. The anococcygeal raphae separates the post anal space into superficial and deep compartments.

ETIOPATHOGENESIS

Although there are many causes of anorectal suppuration, the most common being the infection of cryptoglandular structures. The cryptoglandular theory suggest that blockage of the glandular ducts by faeces or foreign body lead to accumulation of secretions within the glands in the intersphincteric plane with superadded secondary bacterial infection. This leads to abscess formation in the intersphincteric plane which can extend distally along the conjoint longitudinal coat to emege subcutaneously as a perianal abscess. The infection may also spread laterally through the conjoint longitudinal coat and external sphincter to present as a ischiorectal abscess. Although perianal and ischiorectal abscess are more common,the infection may also spread proximally to present as a high intersphincteric abscess or can penetrate the levator ani to present as a supralevator abscess.

In addition to tracking along the intersphincteric plane proximally, distally and laterally,the abscess can also track around the anus and rectum, forming the so called horseshoeing. Once the abscess is drained either surgically or spontaneously, the persistent track between the anus and skin can present as a fistula in ano.

Fistula in ano can also be seen in other secondary conditions like the Inflammatory bowel disease, carcinoma, lymphoma, tuberculosis, actinomycosis, lymhogranuloma venereum, HIV, trauma and radiation therapy.

BACTERIOLOGY

Cryptoglandular infection is most commonly caused by enteric pathogens like E.Coli and Bacteroides frsgilis. Infection secondary to blockage of apocrine glands contain skin pathogens,commonly Staph.aureus. although bacterial smears and cultures can be used to differentiate the origin of the abscess, clinically cultures are not routinely used in deciding the treatment. Cultures are commonly done in immunosuppressed patients presenting with atypical abscesses.

2.6 FISTULA IN ANO

INTRODUCTION

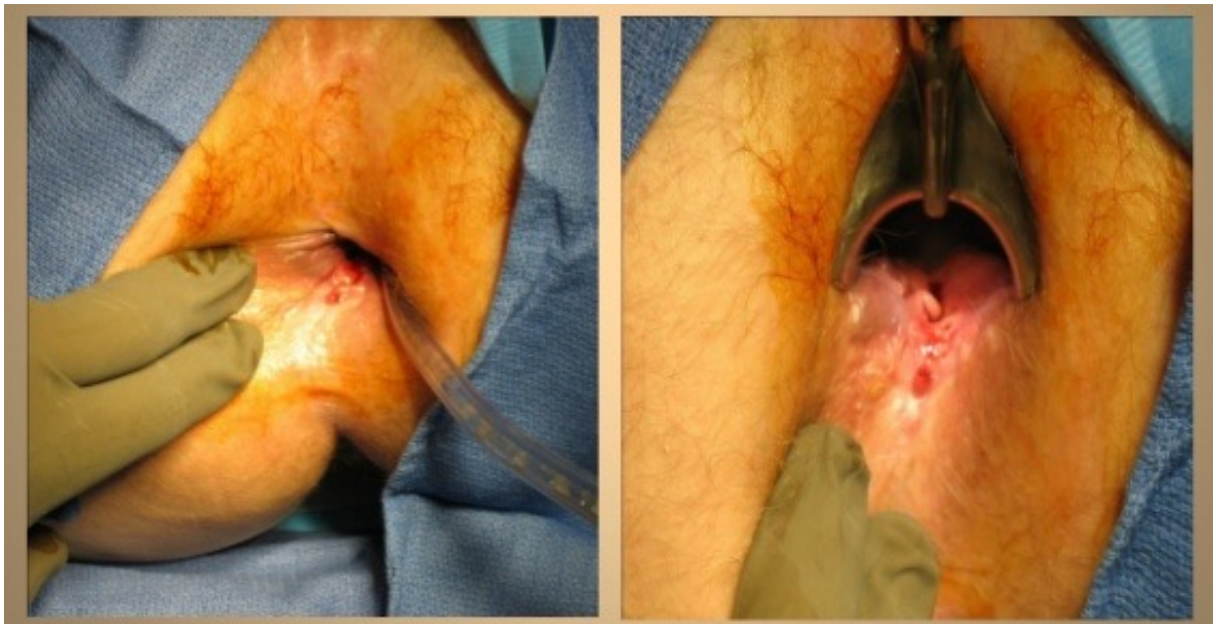


Fig.11 Shows external opening of the fistula in ano at 6'o clock position

Fistula in ano is an abnormal communication between the perianal skin and the anal canal with or without abscess formation. The commonest cause for fistula in ano is perianal sepsis which had been drained spontaneously or with surgical intervention. About 50% or more of the patients who develops anorectal abscess develops fistula in ano later. The other causes for fistula in ano includes inflammatory bowel diseases , tuberculosis, perineal trauma and anorectal malignancies.

CLASSIFICATION OF FISTULA IN ANO

Park classified fistula in ano into four different types depending on its relation to the anal sphincters. The surgical treatment of the fistula depends on the understanding of the relation of the fistula to the anal sphincters.

INTERSPHINCTERIC FISTULA IN ANO

It is the most common variant. Here the fistulous tract originate in the intersphincteric space to have its internal opening at the dentate line, passes downwards directly to open externally at the anal verge. Sometimes the intersphincteric fistulas can have a high blind tract all the way upto the supralevator space.

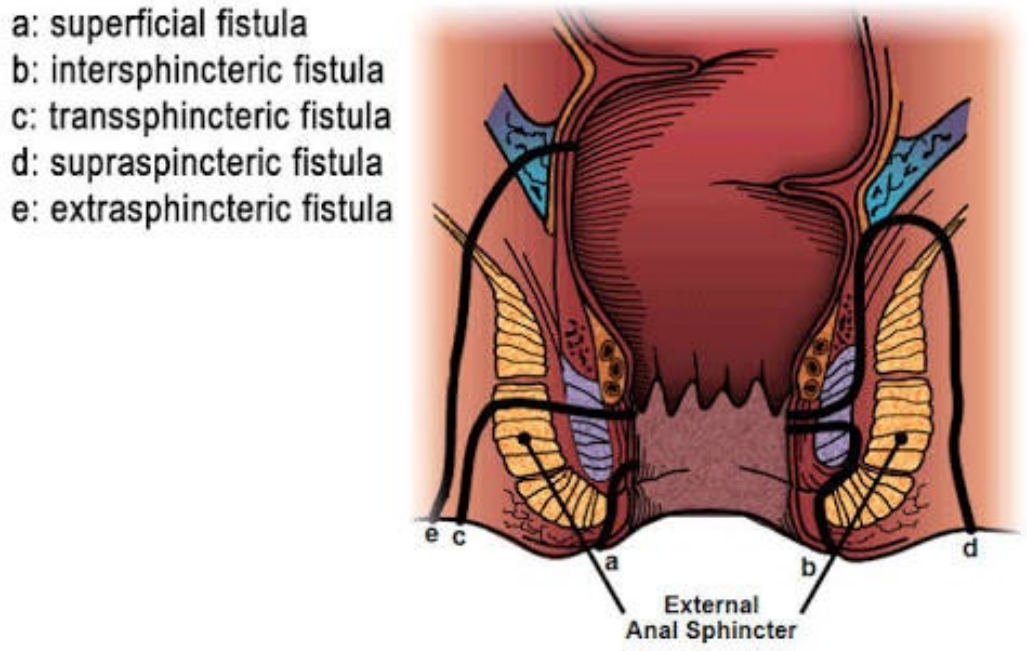


Fig.12 Shows various types of fistula in ano

TRANSSPHINCTERIC FISTULA IN ANO

It is the second most common variant. It is commonly due to inadequately treated ischiorectal abscess. Here the fistulous tract passes from the intersphincteric plane, pierces the external anal sphincter to reach the ischiorectal space and then to the skin. The transsphincteric fistula may involve the entire external anal sphincter or only part of it. Transsphincteric fistulas can also have a high blind tract in the ischiorectal space.

SUPRASPHINCTERIC FISTULA IN ANO

This is the result of a supralevator abscess which has drained through the levator ani muscle into the ischiorectal space and then to the skin. The fistulous tract passes upwards in the intersphincteric plane to reach supralevator space and then passes downwards through the levatoe ani muscle to reach the ischiorectal space.

EXTRASPHINCTERIC FISTULA IN ANO

In this least common variety, the fistulous tract lies outside the sphincteric complex. The external opening is seen in the skin of the ischiorectal region, then passes upwards to reach the ischiorectal space, pierces the levator ani muscle to open into the rectum. Sometimes extrasphincteric fistula can be iatrogenic when the surgeon forcefully probes the transsphincteric fistula in search of the internal

opening and creates a false passage. Extrasphincteric fistulas can also result in inflammatory bowel disease,perineal trauma and in pelvic abscesses which are drained through the ischiorectal fossa.

GOODSALL'S RULE

Goodsall's rule predicts that if a transverse anal line is drawn transversely through the anus,an external opening anterior to this transverse anal line will have a radial tract to open in the dentate line,whereas an external opening posterior to the transverse anal line will have a curved fistulous tract to open in the posterior midline. The exception to this rule is an anterior fistula with its external opening lying 3cm or more from the anal verge,will have a curved path like a posterior fistula to have its internal opening in the posterior midline.

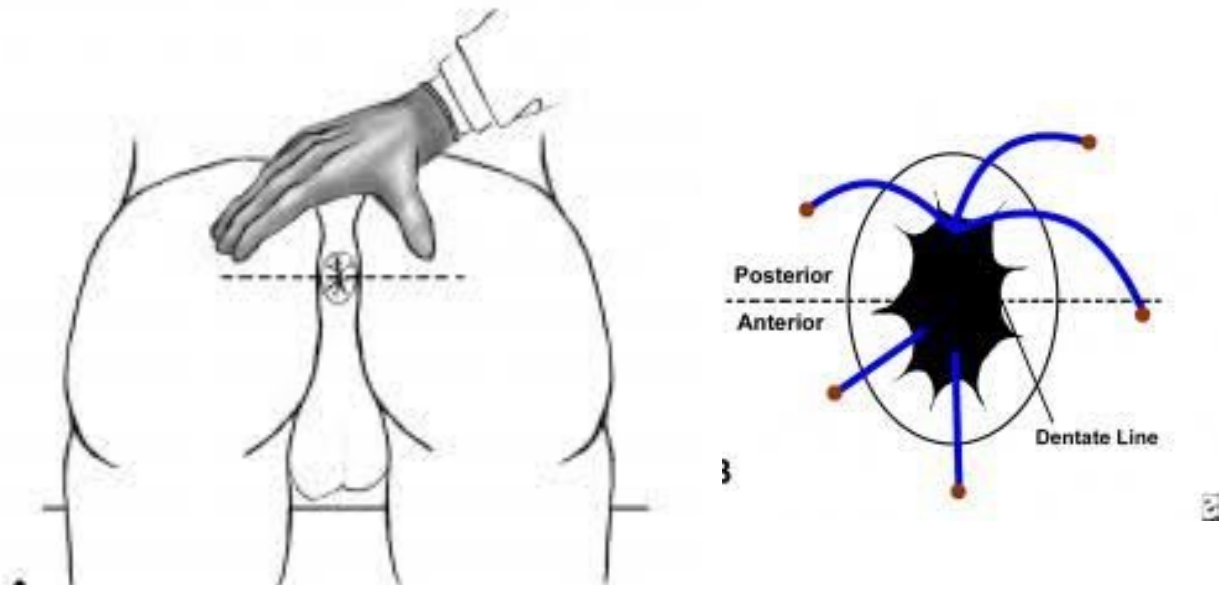


Fig 13. Shows Goodsall's rule

2.7 INVESTIGATIONS

X-RAY FISTULOGRAM

It can detect only if there is any internal opening is present or not. It has high false positive and false negative results. It has very less sensitivity and specificity when compared to MRI and endoanal ultrasound.

Fig.14 Shows an x ray fistulogram in anterior and lateral views. Shows contrast leak into the rectum through the internal opening.

MRI FISTULORAPHY

It is the most important useful diagnostic method used in finding the out the pathology in the fistula in ano. It is useful in accurate detection of fistula in ano. It mainly locates the fistula with regards to the anal sphincter and also it identifies the internal orifice and branching of the fistula and also locates the purulent collections and assessment of surrounding soft tissues. It is mainly used

for deciding surgical treatment of fistula in ano. The sensitivity of MRI fistulography can be increased by administering gadolinium based contrast medium into the fistulous canal.

This procedure does not need any patient preparation. Most commonly used contrast agent is paramagnetic gadolinium. The concentration of the contrast agent should be decided. Usually 2 drops of gadolinium with 7-0 needle to 1cu. Cm of saline is injected into the external orifice of the tract using a butterfly cannula without catheter and after that the external orifice is closed with a gauze and a 1.5 or 3 tesla scanner with surface coil used at the level of hip joints. Both T1 and T2 weighted images are obtained in sagittal, coronal and transverse planes.We then get the images with slice thickness of 4mm and 1mm gap.

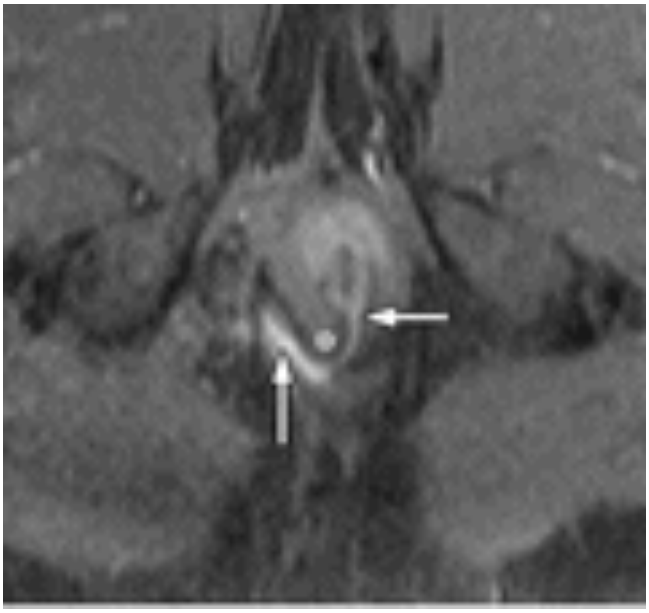


Fig.15 Shows the MRI fistulogram, showing hyperintense fistulous tract with gadolinium contrast

T1 weighted images shows the hypointensive tracts and T2 weighted images show hyperintensive tracts. MRI fat suppression sequences aids in detailed analysis of fistulous canals with highly hyperintense contrast agent surrounded by hypointense background.

It shows the multiplanar images and high degree of soft tissue differentiation and highly efficient in the detection of perianal fistulas and perianal abscess when compared to endoanal ultrasound(EAUS). Sensitivity is 100% and specificity is 86% . In horse shoe fistula both sensitivity and specificity is 100% and for the internal opening it is 96% and 90% respectively. It helps only in visualisation of main canal of fistulas. And also, it is costlier than Endoanal Ultrasound (EAUS).

ENDOANAL ULTRASOUND

It is a medical test which enables us to identify varies pathology in the rectum and the anal canal. With this investigation we could identify tumours, tears, fistulas and aslo provides information about the lymphnodes if any. Endoanal ultrasound is mainly used to check sphincter of the anus. The patient is prepared by giving enema the evening before and the morning of the procedure and the patient is instructed not to eat or drink for 4 to 6 hrs before the procedure. Now the patient is scanned in left lateral position and the lubricated probe is inserted into the anal canal and gently withdrawn down the canal .during this process the images of

various structures are obtained. The defects are commonly noted at three areas – upper, middle and lower anal canal. In case of any mass, the needed biopsy can be taken. The whole procedure takes about 30 to 60 mins after the procedure short monitoring of the patient is necessary.

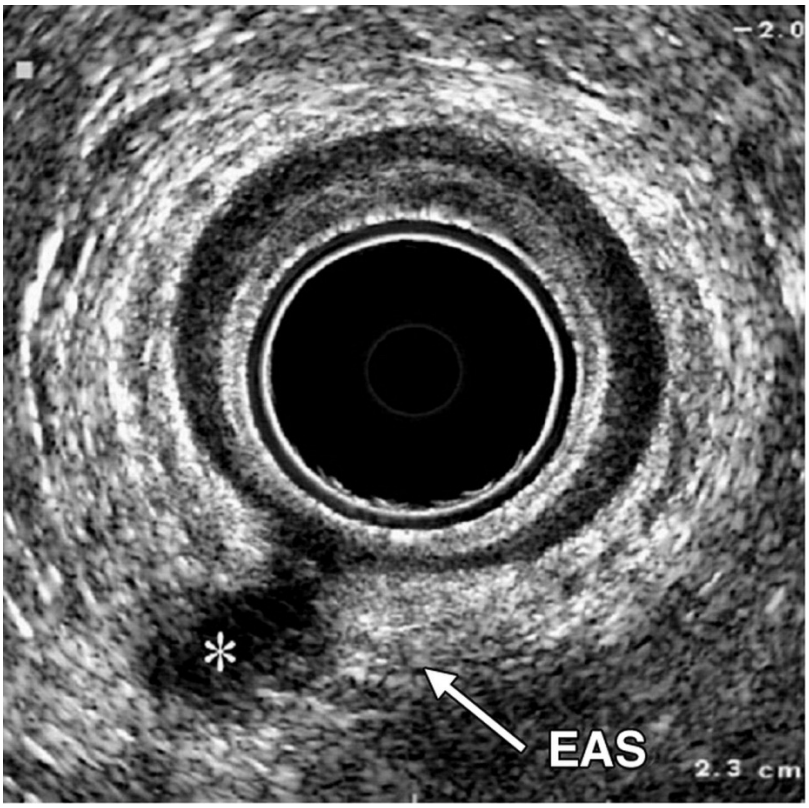


Fig.16 Shows endoanal ultrasound showing a fistulous tract through the external anal sphincter

The fistula appears as hypoechoic tract or focal soft tissue lesions within the anal wall. Endoanal ultrasound 3D that provides excellent imaging of the rectal wall layers and the anal sphincters and hence an excellent tool at visualizing intersphincteric fistula and the relationship to anal canal. It is economically better

when compared with MRI Fistulography. Less specificity than MRI. Structures beyond the probe cannot be visualized. Inability to accurately delineate anatomic spaces outside the external anal sphincters

EXAMINATION UNDER ANAETHESIA

In most patients, the anatomy of the fistula, its extension and it relation to surrounding sphincteric complex can be well established in the operating room by examining the patient in regional or general anaesthesia by putting the patient in prone jack-knife position. The buttock is spread apart and infiltration of local anaesthetic agents are not recommended until the end of the procedure because it may distort the normal anatomy.

The perianal area should be carefully inspected for the presence of any external opening,which is usually seen as a red elevated granulation tissue. The anal canal is carefully examined by a bivalve speculum. The internal opening if present is often seen as a dimple or induration at the level of the dentate line. The anal canal is palpated to feel for any induration which may represent a fistulous tract. If the internal opening is not seen,gentle pressure over the external opening may extrude a drop of pus through the internal opening at the dentate line.

The location of the external opening in relation to the transverse anal line may help to identify the course of the fistulous tract upto the internal opening. An

external opening situated posterior to the transverse anal line, may have a curved fistulous tract to have its internal opening in the posterior midline. The external opening situated anterior to the transverse anal line may have a radial tract to open internally anywhere along the dentate line.

The fistulous tract is then gently probed using a malleable fistula probe, starting from the external opening along the fistulous tract upto its internal opening in the dentate line is reached or upto any resistance is reached in the fistulous tract. Then diluted hydrogen peroxide is injected through the external opening and carefully inspect the dentate line for any bubbles which represents the internal opening. Diluted methylene blue can also be used.

When the internal opening is not seen with these manoeuvres, further procedure should be deferred and the patient should be subjected to specific investigations like magnetic resonance or endoanal ultrasonography to define the correct anatomy of the fistulous tract.

2.8 SURGICAL PROCEDURES

The primary goal in fistula surgery is to eradicate the sepsis without compromising the continence mechanism. Since fistulous tract involve some amount of sphincter complex, surgical treatment depends on the location of the internal and external opening and also the course of the fistulous tract. The external opening is easy to identify and is visible as a small elevation of granulation tissue with or without active discharge. Since the internal opening is commonly difficult to identify, injection of diluted methylene blue or hydrogen peroxide through the external opening is often helpful.

FISTULOTOMY

The principle step in fistulotomy is to identify the internal and external openings and defining its fistulous tract. Fistulotomy is the procedure of choice for simple intersphicnteric fistulous tract and also for low lying transsphincteric fistulae. The first and foremost step is to define the fistulous tract by gentle probing using a malleable fistula probe. The perianal skin and anal epithelium over the fistulous tract is divided using a diathermy. The fistulous tract is curetted and laid open for healing by secondary intention. If internal anal sphincter is encountered,it is divided. If a considerable amount of external anal sphincter is encountered superficial to the fistulous tract, it is not advisable to divide the striated muscle and render the patient incontinent ,rather insert a seton at this point.

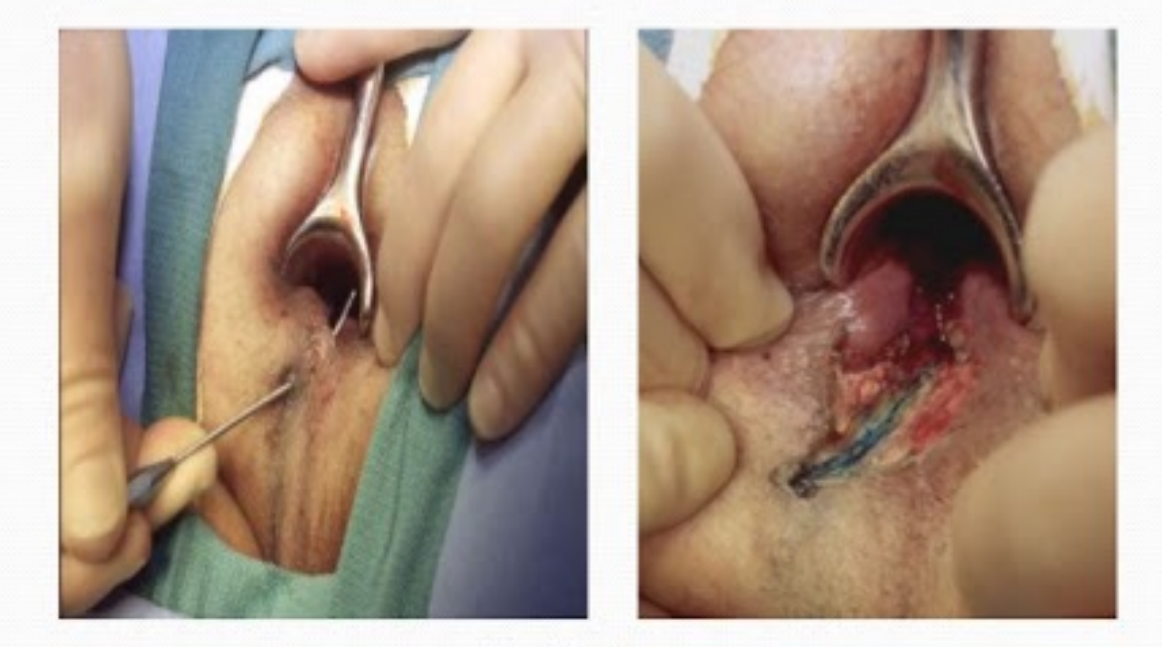


Fig.17(a) Shows fistula in ano at 12’o clock position

(b) shows fistulotomy

Most patients can have more than one external opening. In such patients careful exploration of each fistulous tract is advisable to prevent recurrence. If multiple openings are identified anterior to the transverse transanal line,each fistulous tract is explored and laid open,since anterior fistulas usually have separate internal openings. For multiple posterior fistulas, the tracts tends to coalesce to open in the posterior midline. There is a high chance of having a supralevator abscess in such patients. Hence all the fistulous tracts are carefully explored in a similar fashion without dividing the striated muscle component. The internal opening is carefully explored in the intersphincteric plane to make sure that there is no supralevator collection.

SETON FISTULOTOMY

Seton fistulotomy is the procedure of choice for high anal fistulas involving significant amount of external anal sphincter. The major disadvantage with this technique is that a small number of patients develops a recurrent fistula, but at the expense of preserving the continence function.

This procedure is indicated if there is a considerable amount of striated muscle fibres over the fistulous tract ,which when divided results in incontinence. Here a thick nylon is tied tightly and left in situ so that after a week or two, the external anal sphincter is slowly divided be the process of ischaemic necrosis. Since the process is very slow, the external sphincter does not retract apart leaving

a gutter deformity leading to incontinence, rather the external sphincter heals behind the process of division, so that fibrous tissue is laid down in the fistula bed.

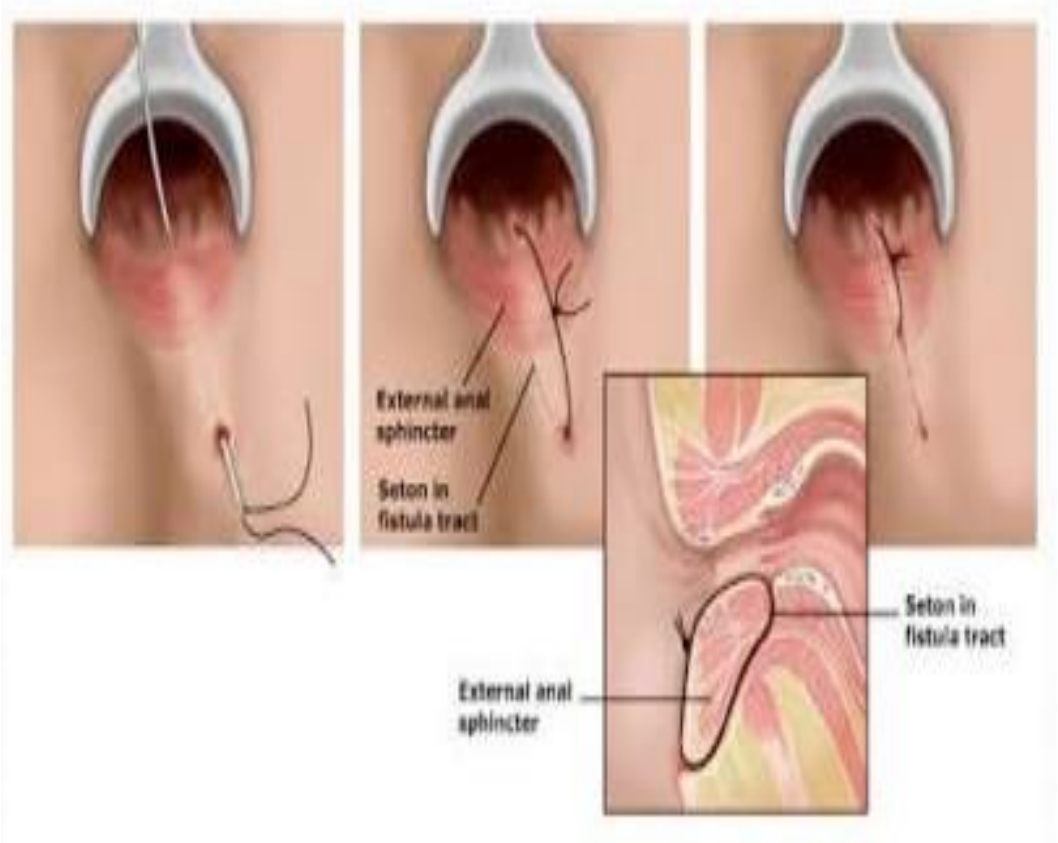


Fig.18 Shows Seton fistulotomy procedure

In this procedure, a conventional fistulotomy is performed after dividing the skin and anal epithelium over the fistulas tract. The internal anal sphincter is usually divided but the external anal sphincter is preserved to prevent incontinence. Now a vascular rubber seton or a nylon is threaded through the eye of the fistula probe and delivered through the anal canal. The seton is secured with multiple knots and end is sutured beyond the last knot to prevent the untie of the knots while the patient is ambulant. After one week, the patient is asked to follow up and

at this time, the seton has partially cut the external anal sphincter. The seton is tightened usually by applying rubber bands beyond the first knot. The patient is again followed up after one week and by this time the seton had completely cut the external anal sphincter and has fallen out. If it has not fallen off, the seton is tightened again and review after one week. This procedure preserves the sphincter mechanism and prevents gutter deformity. The patient should be followed up regularly to ensure that the wound does not become infected and that there is no bridging over the fistulotomy wound during healing.

FISTULECTOMY

The procedure is done to remove a perianal fistula that can form after someone develops a perianal abscess. The fistula may form 4 to 6 weeks or even a year after the initial abscess. Of those who develops perianal abscess, 50% of the abscess will develop a fistula.

Fistulectomy is a procedure of excising the fistulous tract from external opening upto the internal opening. It needs careful dissection under direct vision to avoid any damage to external anal sphincter. Although the procedure preserves most of the anal sphincter function , there is a high recurrence rate because of the breakdown of the lower site.

Fig.19 Shows fistulectomy

MUCOSAL ADVANCEMENT FLAP

Mucosal advancement flap is used primarily for extrasphincteric and suprasphincteric fistula in ano and also for rectovaginal fistula. After infiltrating the mucosa with weak adrenaline solution,a transverse inscision is made at the level of the internal opening upto the internal anal sphincter. The internal sphincter is opened transversely to enter the intersphincteric plane. The internal sphincter is divided in the intersphincteric plane caudally for about 4 to 5 cm. Lateral incisions are made on either side of the fistulous opening along the long axis of the anus but

diverging from one another as they extend cranially, thus creating a flap with wide base and a tapering apex. Thus a flap of mucosa, submucosa and internal sphincter is created. The fistula is then excised by transverse incision of the lower part of the flap. The mucosa and the internal sphincter below the transverse incision are dissected free and direct anastomosis is made between the apex of the flap and the cut anal canal.

Newer alternatives to fistulotomy are preferred to avoid the chance of incontinence especially with complex or recurrent fistulae. Currently there are two such therapies that use biological material to close to fistulas without dividing the sphincter muscle, the fibrin glue and the porcine small intestinal submucosa plug. Both products promote healing by proving a natural extracellular matrix that acts as a scaffolding ,allowing the ingrowth of host tissues.

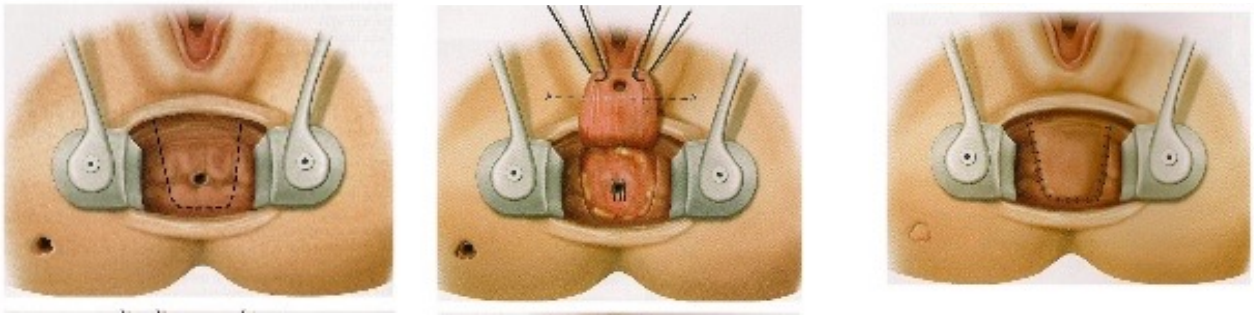


Fig 19. Mucosal Advancement Flap

FISTULA PLUG

This surgery is primarily used for complex or recurrent fistulas. Complex fistulas are those fistulas that in most instances did not heal after the traditional surgery, fistulas that burrow very deep under the muscles, or fistula caused by the inflammatory bowel diseases called Crohn's diseases.

The fistula plug is made out of an absorbable material from porcine small intestinal submucosa (SIS) that is used to fill the fistula cavity. During surgery the fistulas tract is identified and the plug is placed within the fistula and sewn into space. Over time the fistulous tract heals and the plug dissolves helping to form scar tissue. When comparing the fistula plug to the fibrin glue, the fistula plug was found to be superior. This surgery is an excellent option for the complex fistulas as there is no risk of incontinence and if it fails it can safely be performed again. Recent study comparing the effectiveness of fistula plug with fibrin glue have shown that,after 3 months the fistula closure rate was 60% with fibrin glue and 87% with SIS plug. Although the success rates are variable,the benefit is that, there is no sphincter damage.

FIBRIN GLUE

This procedure, like the anal fistula plug, is primarily used for complex or recurrent fistulas. The glue is made up of two types of human serum, fibrinogen

and thrombin. After injecting the glue into the fistula and suturing the internal opening, the glue hardens and over time dissolves. The advantage of this technique is that there is no risk of incontinence and it could be repeated if it failed. The disadvantage is that the glue typically fell out of the tract and results were very poor. The recent literature reviews have shown that the rates of fistula closure after fibrin glue injection ranges from 14 to 60%.

Fig 21. Fibrin plug and glue techniques

VIDEO ASSISTED ANAL FISTULA TREATMENT (VAAFT) :

Video assisted anal sphincter anal fistula treatment (VAAFT) is recently introduced advanced technique used in the treatment of fistula in ano. VAAFT is minimally invasive surgical technique and it is also a sphincter saving technique used in the treatment of complex fistula in ano.

VAAFT kit includes fistuloscope, unipolar electrode, an obturator, an endobrush or a Volkman's spoon and cyanoacrylate. Fistuloscope has two taps. One of the tap connected continuously to 5000 ml bag og glycine – mannitol 1% Solution. Surgery can be performed usually under spinal anaesthesia with patient in the lithotomy position or prone jack knife position.

Fig .22 Shows the fistuloscope

VAAFT has two procedural phases – diagnostic phase and operative phase. The purpose of diagnostic phase is to exactly locate the position of internal anus opening, to know the accurate length of fistulous tract and to diagnose any complex or secondary fistulous tract and to locate any abscess cavities. The fistuloscope is gently passed through the external opening with obturator as the guide. If the external opening is too small, the surrounding fibrous tract can be excised to facilitate the easy passage of the fistuloscope. Once the fistuloscope is carefully probed, the tip of the fistuloscope can be seen coming out through the internal opening in the rectal mucosa. If the internal opening is too small the tip of the fistuloscope cannot reach the rectal lumen, in such patients the light source can be seen beneath the rectal mucosa at the site of internal opening.

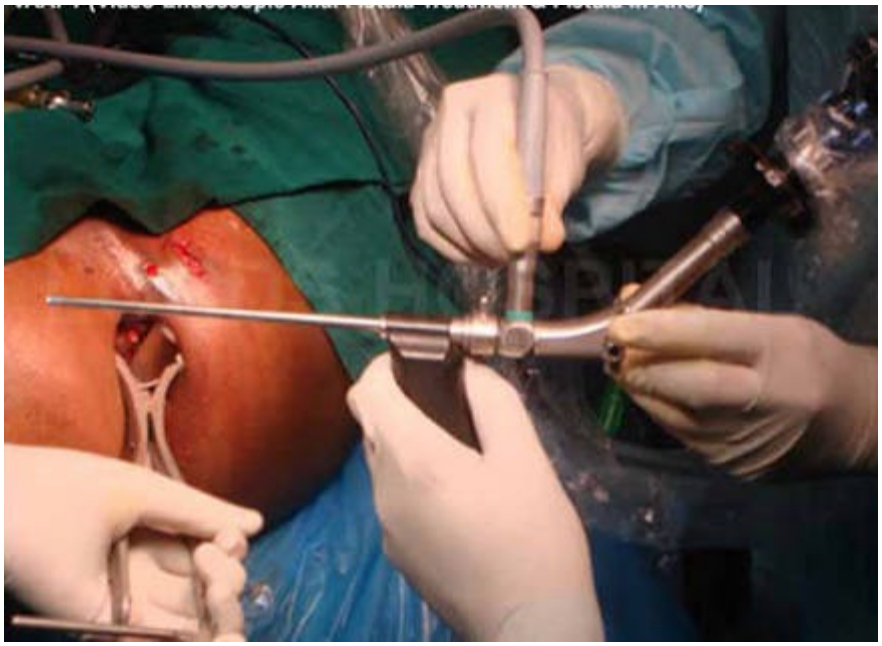


Fig.23 shows VAAFT procedure being done

Once the diagnostic phase is over, the operative phase includes through debridement of the fistulous or drainage of any abscess cavities. After complete visualization of the fistulous tract, the obturator is removed and in that place an unipolar electrode is used. The whitish lumen of the fistulous tract is cauterisied completely using the unipolar electrode. With the use of endobrush the cauterized tissue are delivered out which can be aided by continuous irrigation of glycine. If the cauterized tissue is densly adherent to the underlying structures , it can be delivered out with the help of volkman's spoon. Once the internal opening is reached the assistant hooks the internal opening with the use of suture thread creating a volcano. By using a linear cutting stabler the internal opening is carefully excised and the defect is closed by hans-sewen sutures or by mucosal advancement technique. Once the internal opening is closed, 0.5ml of synthetic cyanoacrylateis injected just beneath the suture line to ensure that the internal opening is completely sealed. Then the fistuloscope is removed with continuous irrigation of glycine.

This procedure is minimally invasive and since the procedure is done endoluminal vision, damage to surrounding sphincteric complex is very minimal. With the use of VAAFT the detection of internal opening is around 85%. Moreover VAAFT can also be identify ant secondary fistulous tract, chronic abscesses and also complex fistulas. Since the procedure is sphincter saving, there is no

possibility of incontinence and the postoperative pain is very minimal. The disadvantage is that it is very expensive and expertise is need.

LIGATION OF INTERSPHINCTERIC FISTULA TRACT (LIFT)

This procedure was initially published ROJANASAKUL et al. from Thailand. The main objectives of this procedure is to identify the internal opening, removal of the intersphincteric sepsis and suturing of the external anal sphincteric defect. In this procedure the intersphincteric space is entered and the fistulous tract is carefully ligated close to the internal opening. The internal opening is excised by using a linear stapler and the defect is closed by mucosal advancement as in VAAFT. The fistulous tract is thoroughly debrided in the intersphincteric plane upto to the external opening. The defect in the external anal sphincter is sutured in order to prevent incontinence.

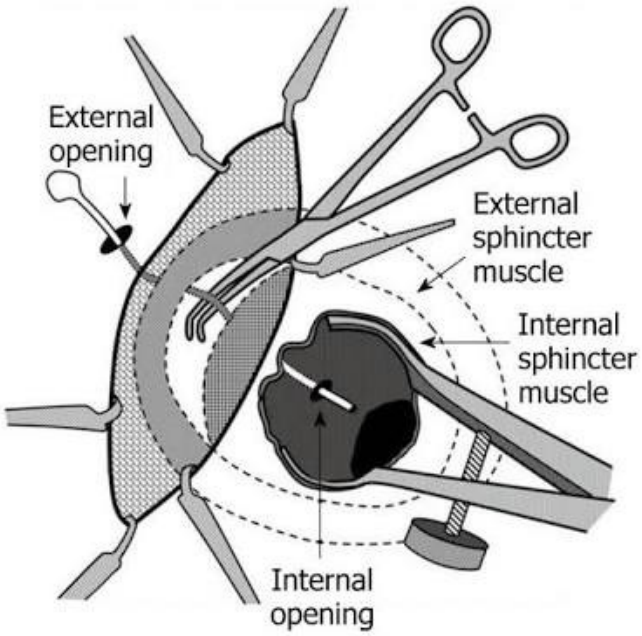


Fig 24. Shows LIFT procedure

Like VAAFT, this procedure prevents the entry of fecael material into the fistulous tract thus avoiding the nidus for further sepsis in the intersphncteric space.

The advantages of LIFT is that there less chance of incontinence because the external anal sphincter is preserved. LIFT technique also has less postoperative pain and failure rate, with healing rate ranges from 40 to 90%.When the LIFT procedure fails to completely heal the fistula, it will downstage the initial transsphincteric fistula to either an intersphincteric fistula or sinus. This medialisation of the external opening to the intersphincteric space facilitates subsequent easier management. Such intersphincteric sinuses can be treated by applying silver nitrate whereas the intersphincteric fistula can be managed by fistulotomy.

RADIOFREQUENCY FISTULOTOMY

This is done by using a 4MHz radiofrequency probe. Studies have shown that this technique has less pain and faster healing. But technique is tried only for low anal fistulas since more studies on this subject is lacking.

Chapter 3

MATERIALS AND METHODS

MATERIALS AND METHODS

3.1 Type of study : Prospective and Retrospective Observational Study

3.2 Study approval : Prior to commencement of this study - Thesis & Ethical Committee of Madras Medical College and Rajiv Gandhi Government General Hospital, chennai had approved the thesis protocol.

3.3 Place of study : Rajiv Gandhi Government General Hospital

3.4 Period of study : Duration starting from August 2014 to July 2015

3.5 Sample size : 75 cases

3.6 Selection of patients:

a) **Sampling method-** Purposive**.**

b) **Inclusion criteria-**

i. Fistula in ano presenting with persistent discharge from external opening (seropurulent or faecal matter) causing pruritis and discomfort.

ii. Recurrence after previous fistula surgery.

c) **Exclusion criteria - -** Patients with perianal injuries

3.7 Study procedure:

Method of sampling was non-random, purposive. After admission short history was taken and physical examination was conducted on each patient admitted in surgery department with features of perianal fistula Baseline investigations, as rotiunely required, were done followed by imaging studies. Patients were then explained about their diseases process and the possible line of management. All the necessary information regarding the study was explained to the patients or their valid guardian. Informed written consent was taken from the patients or their guardian willing to participate in the study. Detailed history was taken from the study group to establish proper diagnosis. Thorough physical examination was done in each case. Data collection sheets were filled in by the investigator himself. All of the preoperative factors related to the patient were noted down in the data sheet. After proper evaluation and preparation, patients who required surgical management were taken up for surgery. Strict aseptic precautions were followed during the operation. Meticulous technique were practiced asa far as possible. The operation procedure and related peroperative factors were observed directly and recorded in the data collection sheet instantly. After completing the collection of data it was complied in a systematic way.

3.8 Variables studied:

i. Age

ii. Sex

iii. Co-morbidities: COPD, jaundice, diabetes, obesity and malnutrition

iv. Chest Xray.

v. MRI Fistulogram

vi. Transrectal Ultrasound

vii. Blood parameters

viii. Types of operations

ix. Post operative complications

x. Pus C/S

xi. Histopathological Examination

3.9 Ethical consideration

All the patients/ legal guardians were given an explanation of the study and about the investigative and operative procedures with their merits and demerits, expected results, and possible complications. If he/she agreed then the case had been selected for this study. The study did not involve any additional investigation or any significant risk. It did not cause economic burden to the patients. The study

was approved by the institutional review board prior to commencement of data collection. Informed consent was taken from each patient/guardian. Data were collected by approved data collection form.

3.10 Data collection

Data were collected by pre-tested structured questionnaire. Data were collected from all the respondents by direct interview after getting informed written consent from them or from their legal guardian.

3.11 Data analysis

Data analysis was done both manually and by using computer. Calculated data were arranged in systemic manner, presented in various table and figures and statistical analysis was made to evaluate the objectives of this study with the help of Statistical Package for Social Science (SPSS).

CHAPTER 4

RESULTS

RESULTS

This descriptive and observational study was carried out to determine the clinicopathology of perianal fistula and the various modalities of treatment and their efficacy. Seventy five patients fulfilling the inclusion criteria from Surgery department of Madras Medical College and Rajiv Gandhi Government General Hospital during the period of August 2014 to July 2015 were selected. All cases were evaluated clinically. Only essential investigations necessary for diagnosis and preoperative assessment were carried out before operations. All patients underwent surgery as warranted in their case. The patients of both sexes and different ages were included in the study. The results obtained are as follows.

Table 1 : Age and Sex Distribution of patients

Age / Sex	Male	Female	Total
18 - 29	13	1	14 (18.67)
30 - 39	20	5	25 (33.33)
40 - 49	9	4	13 (17.33)
50 - 59	11	3	14 (18.67)
> 60	9	0	9 (12)
Total	52 (69.33)	13 (30.67)	75 (100)

* Figures in parentheses indicates percentages

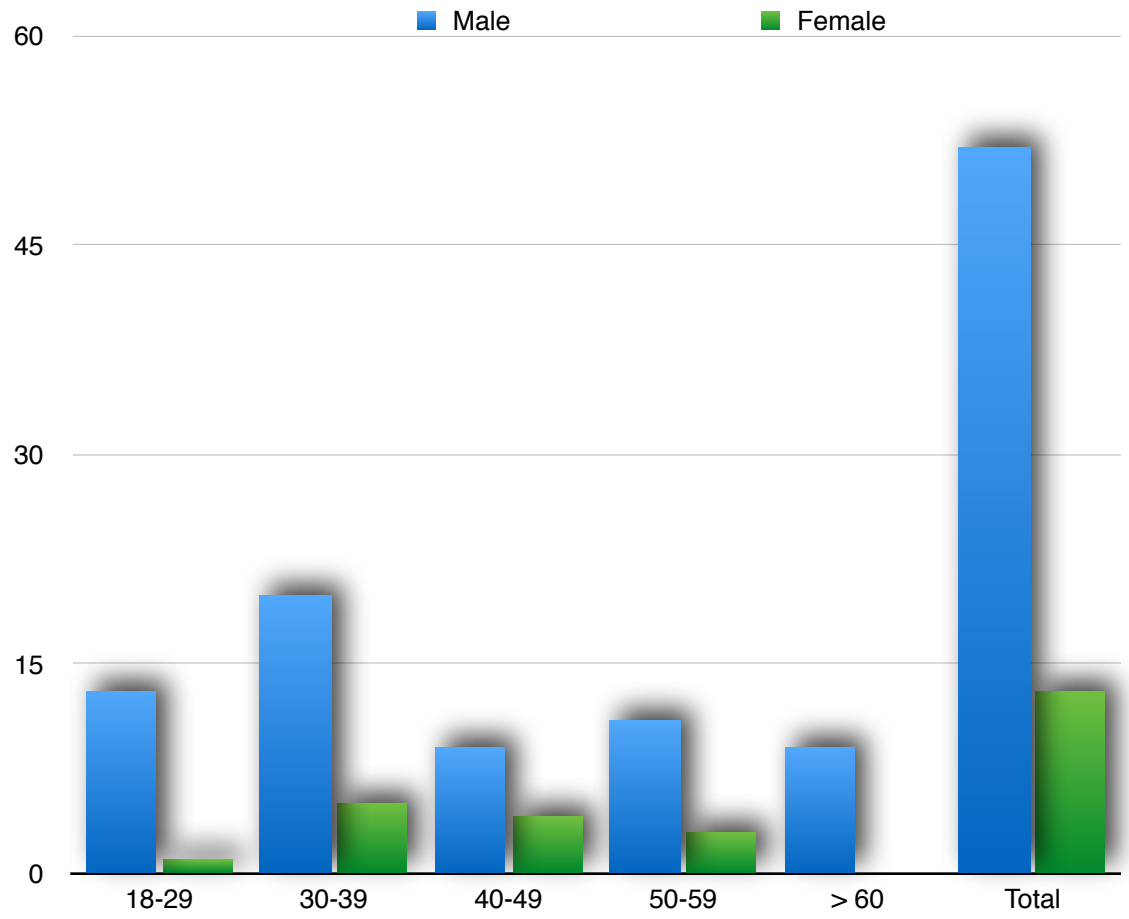


Table 2 : Prevalance of Comorbid Factors in patient group

Co Morbid Factor	Number	Percentage
Diabetes Mellitus	10	13.33
Hypertension	5	6.67
DM & HTN	4	5.33
BA	1	1.33
CAD	1	1.33
Hypothyroidism	1	1.33
No Comorbidity	53	70.67
Total	75	100

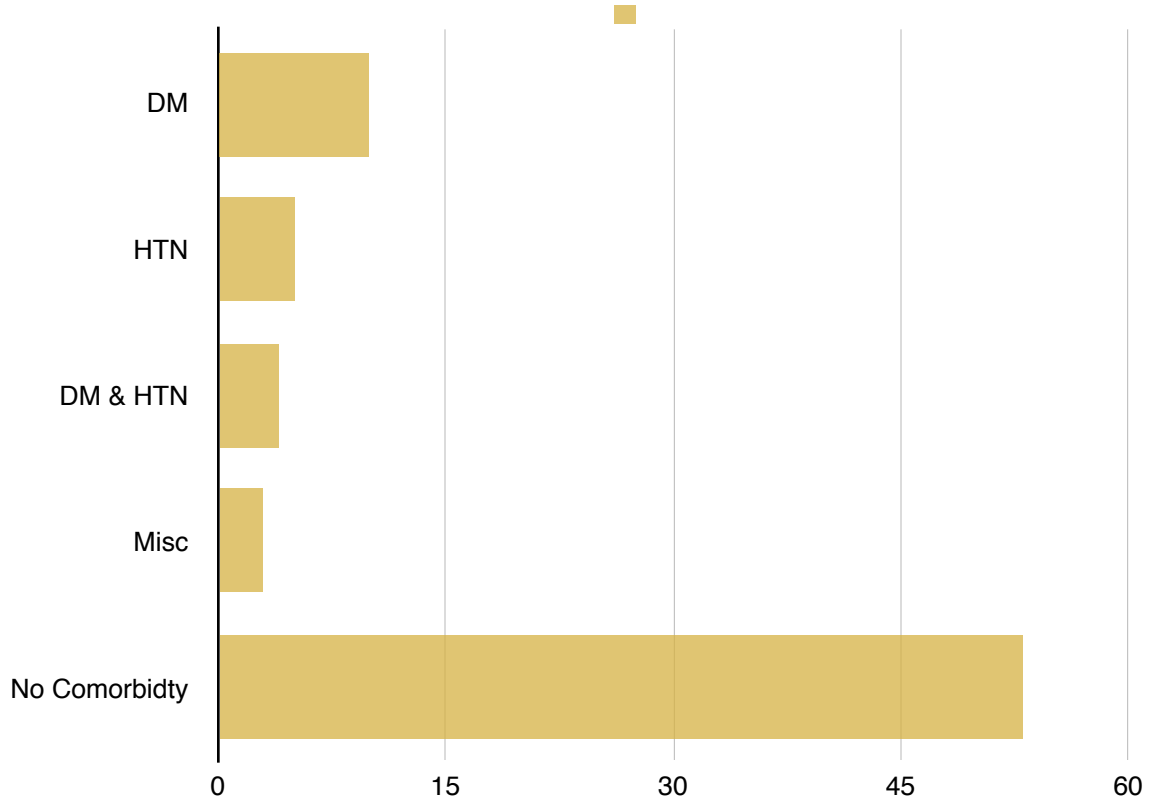


Table 3 : Distribution of Symptoms among the patient group

	Numbers	Percentage
Perianal Discomfort	75	100
Perianal Discharge	38	50.67
Perianal Itching	26	34.67

* - - Patients will have overlapping symptoms so percentages don't add up to 100%

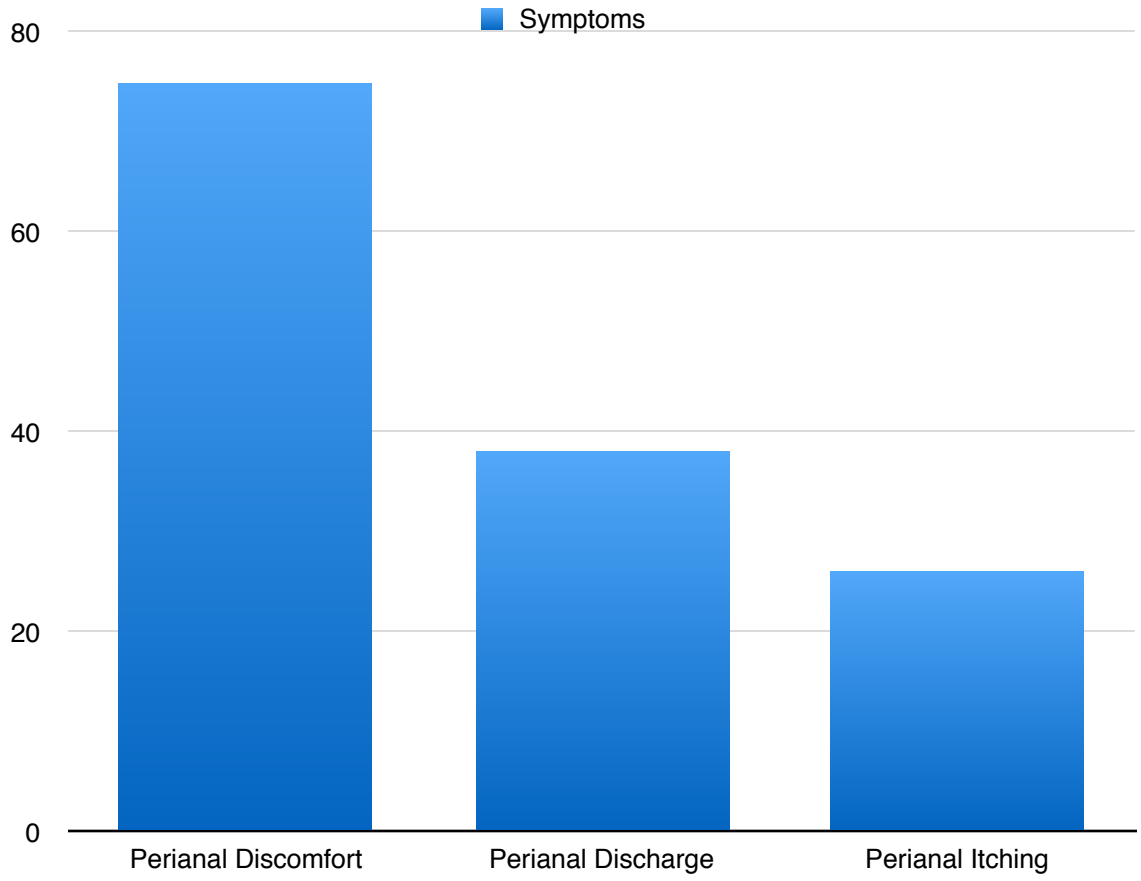


Table 4 : Analysis of Clinical Examination in patients with perianal fistula

Examination		Numbers	Percentage
Openings	External	75	100
	Internal	34	45.33
Position of Ext. Opening	Anterior	29	38.67
	Posterior	46	61.33
Induration		50	66.67

Table 5 : Analysis of Pus C/S among the patients group

Organism	Numbers	Percentage
E.coli	43	57
Psuedomonas	7	9
Klebsiella	19	25
Acinobacter	6	8
Total	**75**	**100**

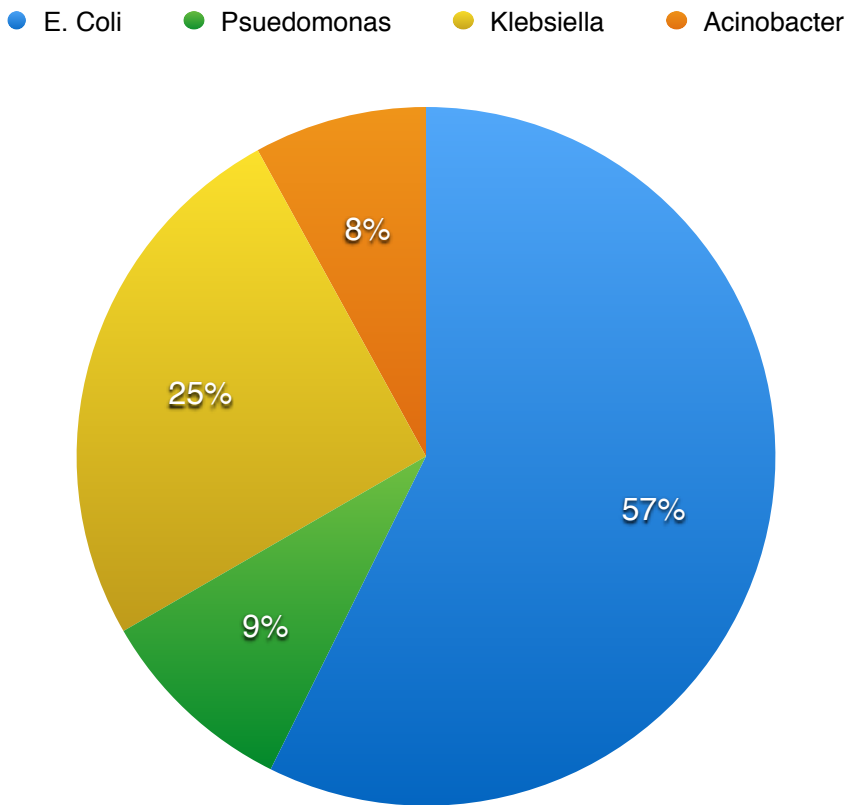


Table 6 : Analysis of various investigations underwent by patients in the study

Investigations		Numbers	Percentage
MRI	Trans-Sphincteric	26	35
	Inter-Sphincteric	43	57
	Supra-Sphincteric	6	8
Trans Rectal USG	Trans-Sphincteric	6	8
	Inter-Sphincteric	0	0
	Supra-Sphincteric	6	8
	Not Done	63	84

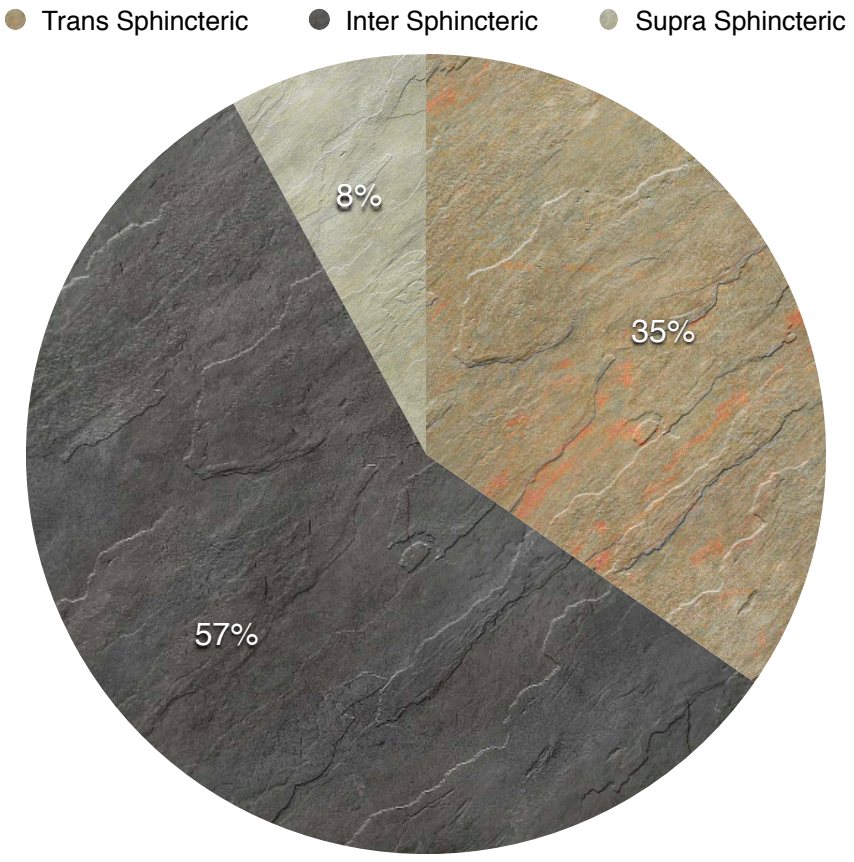


Table 7 : Distribution of operative procedure among patient groups

Operative Procedure	Numbers	Percentage
Fistulectomy	19	25
Fistulotomy	51	68
Seton	5	7
Total	**75**	**100**

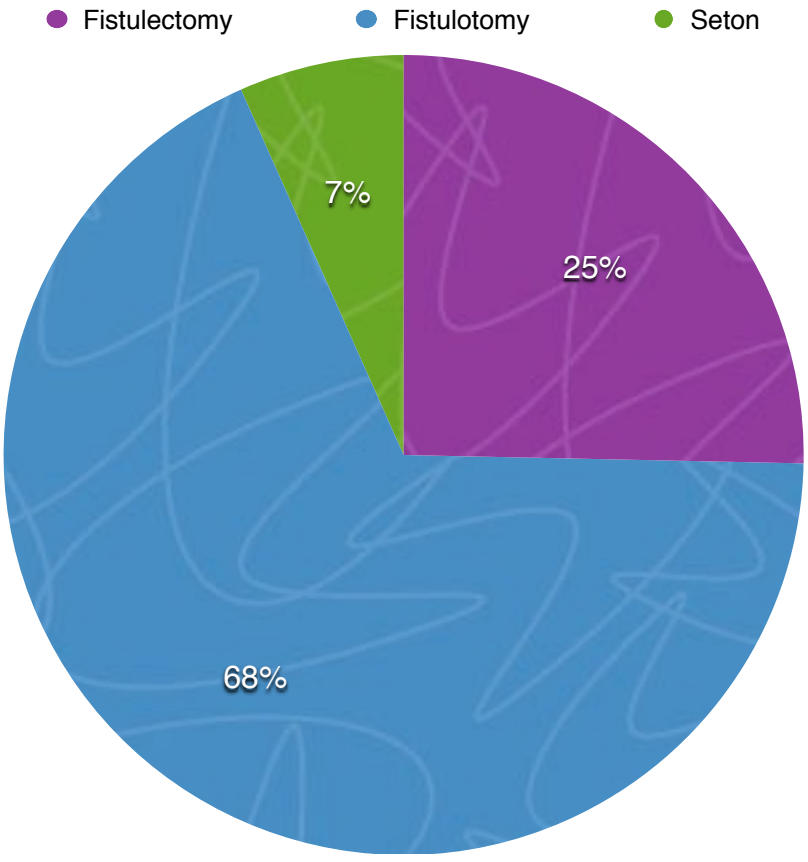


Table 8 : Distribution of procedure underwent with respect to type of fistula

Procedure		Numbers	Percentage
Fistulectomy	Trans Sphincteric	5	6.67
	Inter Sphincteric	14	18.67
	Supra Sphincteric	0	0
Fistulotomy	Trans Sphincteric	21	28
	Inter Sphincteric	29	38.67
	Supra Sphincteric	1	1.33
Seton	Trans Sphincteric	0	0
	Inter Sphincteric	0	0
	Supra Sphincteric	5	6.67
Total		**75**	**100**

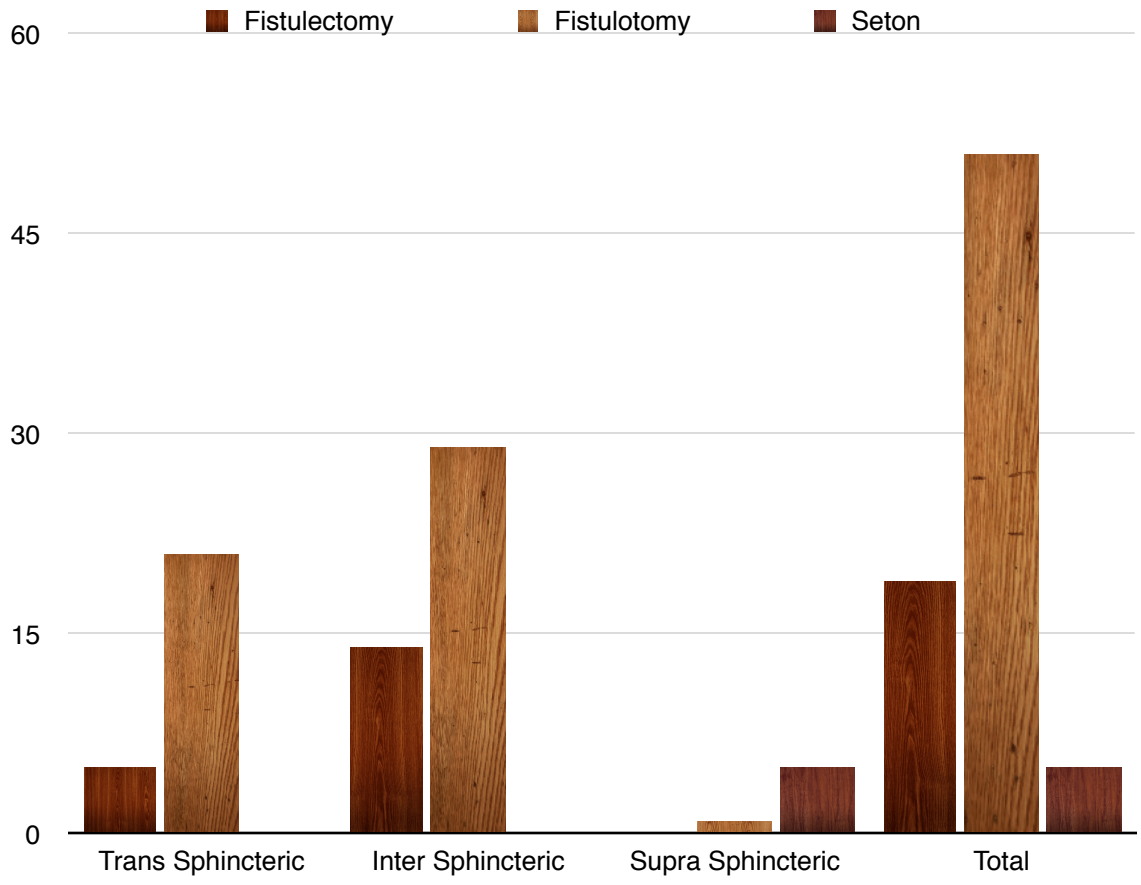


Table 9 : Prevalence of Complications Among Patient Group

Complications	Numbers	Percentage
Persisting Sepsis	9	12
Incontinence	12	16
Recurrence	8	10.67
No Complications	51	68
Total	**75**	**100**

Table 10 : Analysis of complications with respect to procedure

Complications	Fistulectomy	Fistulotomy	Seton	Total
Persisting Sepsis	0	4	5	9
Incontinence	9	2	1	12
Recurrence	2	5	1	8
No Complications	8	43	0	51

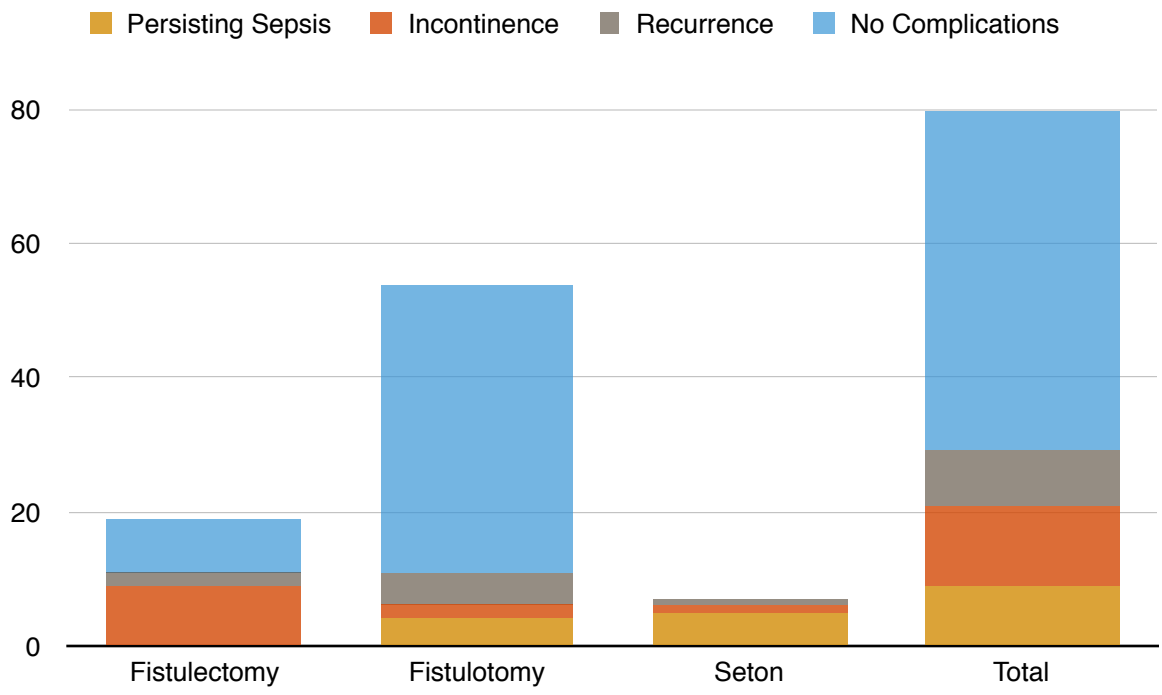
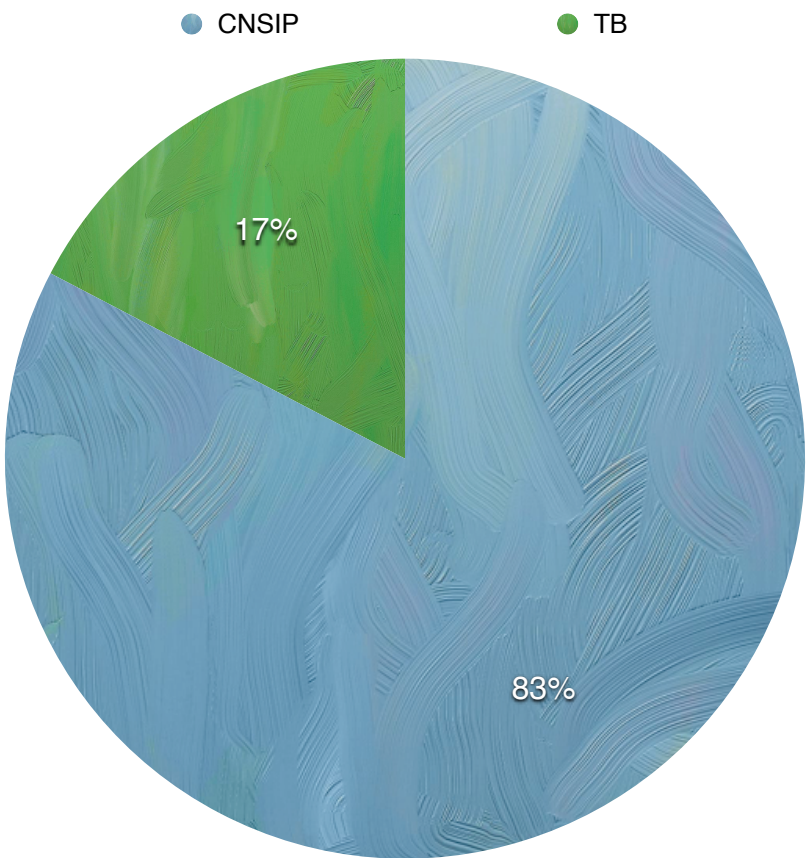


Table 11 : Analysis of histopathology of fistula tract

Histopathology	Numbers	Percentage
Chronic Non Specific Inflammation	62	83
Tuberculosis	13	17
Total	**75**	**100**



CHAPTER 5

DISCUSSION

DISCUSSION OF RESULTS

This descriptive and observational study was carried out to determine the clinicopathology of perianal fistula, including the various modalities of treatment and its efficacy. Seventy five patients fulfilling the inclusion criteria from Surgery department of Madras Medical College and Rajiv Gandhi Government General Hospital during the period of August 2014 to July 2015 were selected.

Age of 75 patients ranged from 18-75 years. The patients were predominantly of the 30 - 39 age group. There was not much involvement in extremes of age group. The male to female ratio was ~ 3 : 1. So, it can be assumed that males are the predominantly involved group. There has been no specific pathophysiological reason for the involvement of males.

On analysing the comorbid factors, as expected, Diabetes Mellitus was the predominant comorbid factor, seen in 10 patients (13.3%), with systemic hypertension seen in five patients (6.67%). Both Diabetes Mellitus and systemic hypertension was seen in four patients (5.33%). More than seventy percent of the patients had no comorbidities.

On evaluation of the presenting symptoms, all the seventy five patients had perianal discomfort. More than fifty percent of the patients (38 patients), presented with perianal discharge. Twenty six patients (34.67%) presented with perianal itching. Clinical evaluation of the patients, by means of per-rectal examination, showed presence of external openings in all the seventy five patients, while internal opening was made out by means of proctoscopy in only thirty four patients (45.33%). Among the seventy five patients, twenty nine had their external opening in the anterior circumference, that is from nine o clock to three o clock position while the remaining forty six patients had their external opening in the posterior circumference. Signs of collection and active infection, evident by presence of induration was seen in as much as fifty patients (66.67%).

An analysis of the pus culture and sensitivity from the discharge, showed the presence of E. Coli in forty three patients (57%), while psuedomonas was seen in seven patients (9%), Klebsiella in nineteen patients (25%) and Acinobacter in six patients (8%).

Proceeding to investigations, routine blood investigations showed no abnormalities. Imaging was done by means of either fistulogram, MRI or Trans Rectal Ultrasonogram. MRI showed the presence of Trans-sphincteric fistula in

twenty six patients (35%), while inter sphincteric fistula was seen in forty three patients (57%) and suprasphincteric fistula in six patients (8%). Trans Rectal USG was done in only twelve patients, with six patients each showing transsphincteric and suprasphincteric fistula. Fistulogram was useful in making out both the external and internal openings in all the patients but gave no useful information regarding the course of the tract nor about the presence of any collections.

Regarding the procedures performed, nineteen patients (25%) underwent fistulectomy, while the majority of the patients, around fifty one (68%) underwent fistulotomy. Seton was tried in five patients (7%). On comparing the procedure underwent with the type of fistula the patient had it was found that twenty one out of twenty six trans sphincteric fistula patients underwent fistulotomy while the remaining five underwent fistulectomy. Twenty nine of forty three patients underwent fistulotomy, while in the remaining fourteen patients fistulectomy was done. Seton was done only in suprasphincteric patients.

Histopathological examination of the resected tract showed chronic non specific inflammatory process in sixty two patients (83%) while tuberculosis was seen in thirteen patients (17%).

Twenty four patients developed post operative complications, most common being incontinence seen in twelve patients (16%). Persisting infection or sepsis, indicating remnant tract or preserved anal gland was seen in nine patients (12%). Eight patients (10.67%) had recurrence of symptoms and had to undergo resurgery.

An analysis of the complications with respect to the procedure underwent, showed that patients who had fistulectomy had a complete removal of tract with no evidence of persistent sepsis, but around nine patients had features of incontinence while recurrence was seen in two patients. Fistulotomy patients had the least rates of complication with only eight out of fifty one patients having one. Four patients had persisting sepsis, while two developed incontinence and five patients developed recurrence. All five patients who underwent seton had complications with all five complaining of persistent discharge even after the surgery.

LIMITATIONS OF THE STUDY

As this study has been carried out over a limited period of time with a limited number of patients and there was lack of financial and infrastructural support, it could not have been large enough to be of reasonable precision. The follow up period was not long enough to comment about long term morbidity and mortality. More number of patients with perianal fistula need to be analysed to determine the pathophysiology of the disease. The newer modalities of treatment should also be included in future studies. All the facts and figures mentioned here may considerably vary from those of large series covering wide range of time, but still then, as the cases of this study were collected from a tertiary level hospital in our country, this study has some credentials in reflecting the facts regarding prevalence of perianal fistula and the efficacy of various treatment modalities.

SUMMARY

Perianal fistula is common surgical problem encountered in our clinical practice. It is a source of great discomfort patient and causes prolonged morbidity in those patients who are not properly managed or who developed complications. It poses a great dilemma as the management protocols are not very well defined. There is an increasing number if newer treatment modalities available. But their efficacy and clinical indications are not very well established. Moreover there is no clear cut data on the prognostic factors and the clinicoepediomology of the disease. This study tries to throw a light on few of those factors

Age and Sex Distribution :

Males of the thirty to fifty age group was the most affected population. Since they constitute the primary work force in any society, any morbidity of the disease constitutes a great strain on the economy of that family.

Co Morbid Factors :

Diabetes Mellitus is the prevalent comorbid factor, seen epecially in the elderly. Other comorbid factors include hypertension, bronchial asthma etc. None of these seemed to have a significant correlation with the disease process.

Diagnostic Studies :

All patients underwent routine blood investigations. MRI fistulogram was the investigation of choice showing clear information regarding the course of the

tract and the presence of any secondary infections or collections.

Management :

Fistulotomy is the preferred procedure especially in patients with trans sphincteric or inter sphincteric fistula. Fistulectomy was tried mainly for patients with a direct intersphincteric fistula. Seton was indicated for patients with supra sphincteric fistula in whom complete surgical exploration of the tract is not possible.

Morbidity :

The incidence of complications was also low in patients managed by fistulotomy while it was maximum in patients treated with seton. The dreaded complication of recurrence was seen following all three surgeries, with no specific significant association with a single procedure.

RECOMMENDATIONS

On the basis of the findings of the study, the following recommendations can be made:

1. Proper preoperative evaluation which includes MRI fistulogram and planning the treatment is essential to prevent complications.
2. Fistulotomy is the preferred treatment especially in patients with transsphincteric fistula and those with evidence of infection or secondary tract.
3. The prognosis, if properly managed is very good, so proper management protocols need to be established
4. Further large scale studies have to be initiated to determine methods of early diagnosis and to reduce the morbidity of the disease.

BIBLIOGRAPHY

1. Billingham RP, Isler JT, Kimmins MH, et al: The diagnosis and management of common anorectal disorders. *Curr Probl Surg* 2004; 41:586-645.An in-depth review of current diagnostic and therapeutic approaches to common conditions of the anus and distal rectum.

2. In: Nicholls RJ, Dozois RR, ed. *Surgery of the Colon and Rectum*, New York: Churchill Livingstone; 1997.This well-illustrated compendium of commonly performed colorectal and anal procedures is clearly written and comprehensive

3. Parks AG, Gordon PH, Hardcastle JD: A classification of fistula-in-ano. *Br J Surg* 1976; 63:1-12.A classic description of anorectal suppurative disease, this article includes the acute phase (abscesses) and chronic phase (fistulas). The anatomic descriptions, data, and classification schema are still relevant today.

4. Kerremans R: *Morphological and Physiological Aspects of Anal Continence and Defecation*, Brussels, Arscia, Ultgavon, 1969.

5.Lund JN, Binch C, McGrath J, et al: Topographical distribution of blood supply to the anal canal. *Br J Surg* 1999; 86:496-498.

6. Whiteford MH, Kilkenny III J, Hyman N, et al: The Standards Practice Task Force and the American Society of Colon and Rectal Surgeons. Practice parameters

for the treatment of perianal abscess and fistula-in-ano. *Dis Colon Rectum* 2005; 48:1337-1372.

7. Henrichsen S, Christiansen J: Incidence of fistula-in-ano complicating anorectal sepsis: A prospective study. *Br J Surg* 1986; 73:371-372. 44. Parks AG, Gordon PH, Hardcastle JD: A classification of fistula-in-ano. *Br J Surg* 1976; 63:1-12.

8. Lindsey I, Smilgin-Humphreys MM, Cunningham C, et al: A randomized, controlled trial of fibrin glue versus conventional treatment for anal fistula. *Dis Colon Rectum* 2002; 45:1608-1615.

9. Johnson EK, Gau JU, Armstrong DN: Efficacy of anal fistula plug vs fibrin glue in closure of anorectal fistulas. *Dis Colon Rectum* 2006; 49:1-6.

10.van der Hagen S, Baeten C, Soeters P, et al: Anti-TNF-alpha (Infliximab) used as induction treatment in case of active proctitis in a multistep strategy followed by definitive surgery of complex anal fistulas in Crohn's disease: A preliminary report. *Dis Colon Rectum* 2005; 48:758-767.

11.Abel ME, Chiu YSY, Russell TR, Volpe PA. Autologous fibrin glue in the treatment of rectovaginal and complex fistulas. *Diseases of the Colon and Rectum* 1993; **36**: 447–9. [Autologous fibrin glue may be a viable alternative for the treatment of complex fistula.]

12.Barker PG, Lunniss PJ, Armstrong P, Reznek RH, Cottam K, Phillips RK. Magnetic resonance imaging of fistula-in-ano: technique, interpretation and accuracy. *Clinical Radiology* 1994; **49**: 7–13. [MRI is an accurate imaging method in the assessment of anal fistula.]

13.Christiansen J, Ronholt C. Treatment of recurrent high anal fistula by total excision and primary sphincter reconstruction. *International Journal of Colorectal Diseases* 1995; **10**: 207–9. [Excision of the fistula is based on the principles of the trans-sphincteric approach.]

14.Corfitsen MT, Hansen CP, Christensen TH, Kaae HH. Anorectal abscesses in immunosuppressed patients. *European Journal of Surgery* 1992; **158**: 51–3. [The authors propose an interventionist approach to perirectal abscess in immunocompromised patients, but minimize the extent of the operation and use antibiotics.]

15.Deen KI, Williams JG, Hutchinson R, Keighley MRB, Kumar D. Fistulas in ano: endoanal ultrasonographic assessment assists decision making for surgery. *Gut* 1994; **35**: 391–4. [Anal endosonography is accurate in identifying fistulous tracks, fluid collections, and horseshoe extensions, but not the internal openings.]

16.Del Pino A, Nelson RL, Pearl RK, Abcarian H. Island flap anoplasty for treatment of transsphincteric fistula-in-ano. *Diseases of the Colon and Rectum*

1996; **39**: 224–6. [Closure of the internal fistulous opening by using an advancement flap of perianal skin.]

17.Eisenhammer S. A new approach to the anorectal fistulous abscess based on the high intermuscular lesion. *Surgery, Gynecology and Obstetrics* 1958; **106**: 595–9. [A classic article ascribing the origin of anorectal abscesses to an infection in the intersphincteric space.]

18.Garcia-Aguilar J, Belmonte C, Wong WD, Goldberg SM, Madoff RD. Anal fistula surgery. Factors associated with recurrence and incontinence. *Diseases of the Colon and Rectum* 1996; **39**: 723–9. [Recurrence is related to the complexity of the fistula and the experience of the surgeon. Incontinence after fistulotomy is proportional to the amount of muscle divided.]

19.Garcia-Aguilar J, Belmonte C, Wong WD, Goldberg SM, Madoff RD. Cutting seton versus two-stage seton fistulotomy in the surgical management of high anal fistula. *British Journal of Surgery* 1998; **85**: 243–5. The cutting seton and the two-stage seton fistulotomies are successful in treating the fistula but both techniques cause significant incontinence.]

20.Golub RW, Wise WE, Jr, Kerner BA, Khanduju KS, Aguilar PS. Endorectal mucosal advancement flap: the preferred method for complex cryptoglandular fistula-in-ano. *Journal of Gastrointestinal Surgery* 1997; **1**: 487–91. [Endorectal advancement flap heals most fistulas and preserves continence.]

21.Grace RH, Harper IA, Thompson RT. Anorectal sepsis: microbiology in relation to fistula in ano. *British Journal of Surgery* 1982; **69**: 401–3. [Anorectal abscess growing bowel-derived flora are associated with fistula-in-ano. Those growing skin-derived flora are not.]

22.Guillaumin E, Jeffrey RB, Shea WJ, Asling CW, Goldberg HI. Perirectal inflammatory diseases: CT findings. *Radiology* 1986; **161**: 153–7. [Excellent review of the pararectal spaces in CT scanning.]

23.Ho Y-H, Tan M, Chui S-H, Leong A, Eu K-W, Seow-Choen F. Randomized controlled trial of primary fistulotomy with drainage alone for perianal abscesses. *Diseases of the Colon and Rectum* 1997; **40**: 1435–8. [Only 25 per cent of patients benefit from primary fistulotomy.]

24.Hussain SM, Stoker J, Schouten WR, Hop WCJ, Lameris JS. Fistula-in-ano: endoanal sonography versus endoanal MR imaging in classification. *Radiology* 1996; **200**: 475–81. [Endoanal MR imaging is more accurate than endoanal ultrasound in depicting the anatomy of fistula-in-ano.]

25.Kennedy HL, Zegarra JP. Fistulotomy without external sphincter division for high anal fistulae. *British Journal of Surgery* 1990; **77**: 898–901. [Seventy-eight per cent primary healing with minimal incontinence in a high anal fistula treated by fistulotomy without external sphincter division.]

26.Kuijpers HC, Schulpen T. Fistulography for fistula-in-ano. Is it useful? *Diseases of the Colon and Rectum* 1985; **28**: 103–4. [Fistulography is not accurate in defining the anatomy of the fistula.]

27.Law PJ, Talbot RW, Bartram CI, Northover JMA. Anal endosonography in the evaluation of perianal sepsis and fistual in ano. *British Journal of Surgery* 1989; **76**: 752–5. [Initial description of the use of ultrasound in the evaluation of patients with fistula-in-ano.]

28.Matos D, Lunniss PJ, Phillips RKS. Total sphincter conservation in high fistula in ano: results of a new approach. *British Journal of Surgery* 1993; **80**: 802–4. [The authors describe their intersphincteric approach to the fistulous track and provide their results in 13 patients.]

29.Ozuner G, Hull TL, Cartmill J, Fazio VW. Long-term analysis of the use of transanal rectal advancement flaps for complicated anorectal/vaginal fistulas. *Diseases of the Colon and Rectum* 1996; **39**: 10–14. [Fistula recurrence in one-third of patients with endoanal advancement flap.]

30.Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. *British Journal of Surgery* 1976; **63**: 1–12. [Classic description of the different types of anal fistulas.]

31.Schouten WR, van Vroonhoven TJMV. Treatment of anorectal abscess with or without primary fistulectomy: results of a randomized trial. *Diseases of the Colon*

and Rectum 1991; **34**: 60–3. [More than half of the patients will have no further problems after simple drainage of perirectal abscess.]

32.Seow-Choen F, Ho JMS. Histoanatomy of anal glands. *Diseases of the Colon and Rectum* 1994; **37**: 1215–18. [Anal glands are fairly evenly distributed in the anal circumference at the dentate line.]

33.Thompson JPS, Ross AH. Can the external anal sphincter be preserved in the treatment of transsphincteric fistula-in-ano. *International Journal of Colorectal Diseases* 1989; **4**: 247–50. [Forty-four per cent primary healing of a complex trans-sphincteric fistula with a draining seton without fistulotomy.]

34.Williams JG, MacLeod GA, Rotherberger DA, Goldberg SM. Seton treatment of high anal fistulae. *British Journal of Surgery* 1991; **78**: 1159–61. [Successful treatment of anal fistula with the seton technique.]

APPENDIX - I : ETHICAL COMMITTEE CLEAREANCE

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No. 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. EMIL PHINEHAS M
Postgraduate MS (General Surgery)
Madras Medical College
Chennai 600 003

Dear Dr. Emil Phinehas M

The Institutional Ethics Committee has considered your request and approved your study titled **"A Study on Clinicopathology of Fistula In Ano In RGGGH" No.08082015.**

The following members of Ethics Committee were present in the meeting held on 04.08.2015 conducted at Madras Medical College, Chennai-3.

1.	Prof.C.Rajendran, M.D.,	: Chairperson
2.	Prof.R.Vimala, M.D., Dean, MMC, Ch-3	: Deputy Chairperson
3.	Prof.Sudha Seshayyan, M.D., Vice-Principal, MMC, Ch-3	: Member Secretary
4.	Prof.B.Vasanthi, M.D., Professor Pharmacology, MMC	: Member
5.	Prof.A.Rajendran, M.S., Professor, Inst.of Surgery, MMC	: Member
6.	Prof.Saraswathy, M.D., Director, Inst. Of Pathology, MMC	: Member
7.	Prof.Srinivasagalu, Director, Inst.of Inter Med. MMC	: Member
8.	Tmt. J.Rajalakshmi, J.A.O. MMC, Ch-3	: Lay Person
9.	Thiru S.Govindasamy, B.A., B.L.,	: Lawyer
10.	Tmt.Arnold Saulina, M.A., MSW.,	: Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee

Appendix-II

QUESTIONAIRE

PATIENT DETAILS:

Name: Age: Sex:

IP No. :

ON ADMISSION:

Main Complaints :

Abdominal Pain :

Bowel Habits :

Constitutional Symptoms :

Co – Morbid Illness :

Significant Past History :

Family / Exposure History :

CLINICAL EXAMINATION:

Pulse : BP :

RR : Temp :

Pallor : Icterus :

CVS : RS :

P/A : PR :

INVESTIGATIONS :

CBC : ESR :

Liver Function Test : Renal Function Test :

MRI Fistulogram

TREATMENT

OPERATIVE DETAILS :

Intra Op findings :

Post op Period :

Biopsy (if done) :

FOLLOW UP :

INFORMATION SHEET

TITLE : **"A study on clinicopathology of patients with fistula in ano in RGGGH"**

Name of Investigator : Dr. Emil Phinehas. Name of Participant :

Purpose of Research : The purpose of the study is to analyse the various modes of presentation of abdominal tuberculosis, the common surgeries performed and the outcome of the surgery

Study Design : Prospective & Retrospective Observational Study

Study Procedures : Patient will be subjected to routine investigations, Xray, MRI Fistulogram & Operative Procedure as indicated, Biopsy, if done and the data analysed

Possible Risks : No risks to the patient

Possible benefits

To patient : A better understanding of their problem so has to devise a plan of management which suits their needs.

To doctor & to other people : If this study gives positive results, it can help determine the early identification, most effective diagnostic and treatment protocol for patients with abdominal tuberculosis. This will help in providing better and complete treatment to other patients in future.

Confidentiality of the information obtained from you : The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or

presentation resulting from the research, no personally identifiable information will be shared

Can you decide to stop participating in the study : Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time

How will your decision to not participate in the study affect you : Your decision will not result in any loss of benefits to which you are otherwise entitled.

Signature of Investigator Signature of Participant

Date :

Place :

PATIENT CONSENT FORM

Study Detail	:	**A STUDY ON CLINICOPATHOLOGY OF FISTULA IN ANO RGGGH**
Study Centre	:	Rajiv Gandhi Government General Hospital, Chennai.
Patient's Name	:	
Patient's Age	:	
In Patient Number	:	

I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ❑

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ❑

I understand that sponsor of the clinical study, others working on the sponsor's behalf, the Ethics committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ❑

I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms. ❑

I hereby consent to participate in this study ❑

I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests and to undergo treatment ❑

Signature/thumb impression

Patient's Name and Address:

Signature of Investigator

Study Investigator's Name:

Dr. EMIL PHINEHAS.,

Appendix – III

Statistical formula

A. Sample size:

To determine the sample size, this formula was used; $n = \frac{z^2 pq}{d^2}$

Where,

n = the desired sample size,

z = the standard normal deviate, usually set at 1.96 at 5% level,

which corresponds to 95% confidence level,

p = proportion of population, q

= 1- p

d = the degree of accuracy level considered as 5.0 %,

which assumes 0.05

If population size, N < 10,000 than the required sample size is very much smaller which was calculated by the following formula –

$$n_f = \frac{n}{1 + \frac{n}{N}}$$

Where,

n_f = the desired sample size, when population size, N < 10,000

n = the desired sample size, when population size, N > 10,000 N

= the roughly estimated population size.

B. Arrithmatic mean, $X = \frac{\sum fx}{N}$ (for grouped data)

C. Standard deviation , $SD = \sqrt{\frac{\sum (X - \bar{X})^2}{}}$

('O' indicates observed value and 'E' indicates expected value)

D. $$Z = \frac{P_1 - P_2}{\sqrt{\left[\frac{P_1 Q_1}{N_1} + \frac{P_2 Q_2}{N_2}\right]}}$$

P_1 indicates proportion in first group

P_2 indicates proportion in second group

$Q_1 = 100 - P_1$

$Q_2 = 100 - P_2$

N_1 indicates sample size of first group

N_2 indicates sample size of second group.

E. $$SD = \sqrt{\frac{\sum (X - \bar{X})}{(N-1)}}$$

Here, $\bar{X}$ indicates mean value
X indicates individual value
N indicates sample

APPENDIX IV - - PLAGIARISM

APPENDIX V — MASTER CHART

S.no	Name	Age	Sex	Ip no	Co Morbid	Presenting complaints			Per rectal examination			Position of opening		Investigation						Procedure	Intra op findings		Complications		Recurr	HPE
						Per. Dis.	Per. Disc.	Per. Itc.	Ext. open	Int. open	Indurat	Ant	Post	Haem.	C & S	Fis. Gram		MRI	Trans USG		D.open	ID. Open	per.sep	incont		
																Ext open	Int open									
1	kamala	37	F	12718	-	+	+	-	+	+	+	+	-	WNL	Ecoli	+	+	TS	TS	FO	+	-	-	-	-	CNSIP
2	Ganesh	63	M	1599	DM	+	+	-	+	+	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
3	Santhosh	18	M	11726	-	+	-	+	+	+	-	-	+	WNL	Kleb	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
4	Shanmugam	39	M	125418	-	+	-	-	+	+	+	+	-	WNL	Ecoli	+	+	IS	ND	FE	+	-	-	-	-	CNSIP
5	Kumari	29	F	13999	Hypothy	+	-	-	+	+	+	+	-	WNL	Kleb	+	+	TS	ND	FE	+	-	-	-	-	CNSIP
6	Rajesh	39	M	15928	-	+	-	-	+	-	-	-	+	WNL	Kleb	+	+	TS	ND	FE	+	-	-	-	-	CNSIP
7	kannan	30	M	16282	-	+	-	-	+	+	-	-	+	WNL	Acin	+	+	TS	ND	FO	-	-	-	-	-	CNSIP
8	Kesavan	28	M	126218	-	+	+	-	+	+	+	-	+	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
9	kumar	55	M	125042	-	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	TS	TS	FO	+	-	-	-	-	CNSIP
10	Ramani	30	F	14310	BA	+	+	+	+	+	+	+	-	WNL	Ecoli	+	+	TS	TS	FO	+	-	+	-	+	TB
11	Santhanam	70	M	11313	CAD	+	+	+	+	-	+	-	+	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
12	Rani	38	F	13817	-	+	+	-	+	+	+	+	-	WNL	Kleb	+	+	TS	ND	FO	+	-	-	-	-	CNSIP
13	Murugan	29	M	15977	-	+	-	-	+	-	+	-	+	WNL	Pseudo	+	+	TS	ND	FO	+	-	-	-	-	CNSIP
14	Narayanan	18	M	1774	-	+	-	-	+	-	+	-	+	WNL	Kleb	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
15	Kuppan	70	M	1198	-	+	+	-	+	+	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	+	TB
16	Meganathan	75	M	1271	DM/HTN	+	-	+	+	+	+	+	-	WNL	Kleb	+	+	IS	ND	FE	+	-	-	+	-	CNSIP
17	Rukmani	38	F	15327	DM	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
18	Devandaran	36	M	125318	-	+	+	+	+	+	+	-	+	WNL	Acin	+	+	IS	ND	FE	+	-	-	-	-	CNSIP
19	Kumaresan	18	M	126739	-	+	-	-	+	+	+	-	+	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	TB
20	Karupan	75	M	1388	-	+	+	+	+	+	-	-	+	WNL	Ecoli	+	+	SS	SS	FO	-	+	+	+	+	TB
21	Sengotuvel	72	M	8178	-	+	+	-	+	+	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
22	Kuppamal	49	F	20987	-	+	+	-	+	-	+	+	-	WNL	Pseudo	+	+	TS	TS	FE	+	-	-	+	-	CNSIP
23	Gopal	40	M	24319	DM/HTN	+	+	-	+	-	+	+	-	WNL	Kleb	+	+	TS	TS	FO	-	+	+	-	-	Others
24	Sundarasan	30	M	31408	-	+	-	-	+	-	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
25	Murugan	54	M	54817	-	+	+	+	+	-	-	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
26	Rajasekar	47	M	29388	-	+	-	-	+	-	-	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
27	Das	39	M	28928	-	+	-	+	+	+	+	+	-	WNL	Pseudo	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
28	Thandapani	58	M	25270	-	+	-	+	+	+	+	+	-	WNL	Kleb	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
29	Ramanathan	35	M	26777	-	+	+	+	+	+	+	-	+	WNL	Kleb	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
30	Ganapathy	39	M	26128	HTN	+	+	+	+	-	+	+	-	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	+	TB
31	Usharani	44	F	21993	DM	+	-	-	+	-	-	-	+	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
32	Mohan	33	M	229980	-	+	+	+	+	-	+	-	+	WNL	Acin	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
33	Vijaya	58	F	18791	-	+	+	+	+	-	-	-	+	WNL	Ecoli	+	+	SS	SS	SE	-	+	+	+	-	TB
34	Sekar	39	M	22217	-	+	+	-	+	-	+	-	+	WNL	Kleb	+	+	SS	SS	SE	-	+	+	-	-	CNSIP
35	Loganathan	29	M	26239	-	+	-	-	+	-	-	-	+	WNL	Ecoli	+	+	IS	ND	FE	-	+	+	-	-	CNSIP
36	Nagappan	55	M	25110	DM	+	+	-	+	-	+	-	+	WNL	Ecoli	+	+	IS	ND	FE	-	+	-	-	-	CNSIP
37	Ramesh	32	M	26510	-	+	-	-	+	+	-	-	+	WNL	Kleb	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
38	Imran	49	M	24810	-	+	+	-	+	-	-	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	+	-	-	CNSIP
39	Rajesh	38	M	26928	-	+	+	-	+	+	-	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
40	Krishanan	60	M	25928	-	+	+	+	+	+	+	+	-	WNL	Pseudo	+	+	IS	ND	FO	-	+	-	-	+	TB

41	Govindan	46	M	25988	HTN	+	-	+	+	+	-	+	-	WNL	Kleb	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
42	Rupavathy	36	F	21832	-	+	+	+	+	+	+	+	-	WNL	Ecoli	+	+	TS	ND	FO	+	-	-	+	-	CNSIP
43	Nagaraj	36	M	22823	HTN	+	-	+	+	-	-	-	+	WNL	Acin	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
44	Kamalakannan	28	M	24786	-	+	-	-	+	+	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
45	Kanthaswamy	39	M	23127	-	+	-	-	+	-	-	+	-	WNL	Ecoli	+	+	IS	ND	FE	+	-	-	-	-	CNSIP
46	Moorthy	25	M	27120	-	+	+	+	+	-	+	-	+	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
47	Sundaram	55	M	30973	DM/HTN	+	+	+	+	-	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
48	Pandiyan	59	M	31531	HTN	+	-	-	+	+	-	-	+	WNL	Ecoli	+	+	TS	TS	FO	+	-	-	-	-	CNSIP
49	Rajeev	28	M	29008	-	+	+	-	+	+	+	+	-	WNL	Kleb	+	+	SS	SS	SE	-	+	+	-	-	CNSIP
50	Jeeva	52	M	2978	DM/HTN	+	+	-	+	-	+	-	+	WNL	Ecoli	+	+	IS	ND	FE	+	-	-	+	-	TB
51	Chandra	51	M	31938	-	+	+	-	+	+	-	+	-	WNL	Ecoli	+	+	IS	ND	FE	-	+	-	-	+	CNSIP
52	Kamal	29	M	29139	-	+	+	+	+	+	-	+	-	WNL	Kleb	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
53	Rathinam	40	M	28977	-	+	-	-	+	-	+	-	+	WNL	Kleb	+	+	IS	ND	FE	+	-	-	-	-	CNSIP
54	Gunapushanam	59	F	20733	-	+	-	-	+	-	-	-	+	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
55	Ramalimgam	47	M	32812	DM	+	+	+	+	-	+	+	-	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
56	Vishnu	22	M	51719	-	+	-	+	+	-	-	-	+	WNL	Ecoli	+	+	IS	ND	FE	-	+	-	+	-	CNSIP
57	Suresh	43	M	53719	-	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
58	Ramamoorthy	50	M	39128	DM	+	+	+	+	-	+	-	+	WNL	Pseudo	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
59	Prakash	33	M	37108	-	+	+	+	+	-	+	-	+	WNL	Ecoli	+	+	SS	SS	SE	-	+	+	-	-	TB
60	Nalini	42	F	17382	DM	+	+	-	+	-	+	+	-	WNL	Ecoli	+	+	SS	SS	SE	-	+	+	-	+	TB
61	Rajkumar	28	M	35718	-	+	+	-	+	+	-	+	-	WNL	Acin	+	+	IS	ND	FE	-	+	-	-	-	CNSIP
62	Raja	49	M	33921	DM	+	+	-	+	-	+	-	+	WNL	Pseudo	+	+	TS	ND	FO	+	-	-	-	-	TB
63	Ragavan	38	M	40017	-	+	-	-	+	-	-	+	-	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP
64	Vinayagi	48	F	16310	-	+	-	-	+	-	+	+	-	WNL	Kleb	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
65	Rajaram	50	M	59120	-	+	+	-	+	+	-	-	+	WNL	Pseudo	+	+	IS	ND	FE	-	+	-	-	+	CNSIP
66	Raman	39	M	56109	-	+	+	+	+	+	-	-	+	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
67	Kovarthan	48	M	58210	-	+	-	+	+	-	+	-	+	WNL	Kleb	+	+	TS	ND	FE	+	-	-	+	-	CNSIP
68	Nagarathinam	50	F	19290	-	+	-	-	+	+	+	+	-	WNL	Kleb	+	+	TS	ND	FE	+	-	-	+	-	CNSIP
69	Ganeshan	33	M	59719	-	+	-	-	+	+	+	-	+	WNL	Acin	+	+	IS	ND	FE	+	-	-	+	-	CNSIP
70	Selvaraj	38	M	59929	-	+	+	-	+	-	-	-	+	WNL	Ecoli	+	+	IS	ND	FO	-	+	-	-	-	CNSIP
71	Kumar	60	M	1578	HTN	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	TS	ND	FO	+	-	-	-	-	TB
72	Kanthan	61	M	1678	DM	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	TS	ND	FO	+	-	-	-	-	CNSIP
73	Gilbert	19	M	1149	-	+	+	-	+	+	+	-	+	WNL	Ecoli	+	+	IS	ND	FE	+	-	-	+	-	CNSIP
74	Murugavel	36	M	79290	-	+	+	-	+	-	+	-	+	WNL	Kleb	+	+	IS	ND	FO	+	-	-	-	-	CNSIP
75	Thiyagarajan	59	M	88418	DM	+	-	-	+	-	+	-	+	WNL	Ecoli	+	+	TS	ND	FO	-	+	-	-	-	CNSIP

KEY :

DM - - Diabetes Mellitus

SHT / HTN - - Systemic Hypertension

CAD - - Coronary Artery Disease

BA - - Bronchial Asthma

WNL - - Within Normal Limits

Kleb - -Klebsiella

Pseudo - - Psuedomonas

TS - - Trans Sphincteric

IS - - Inter Sphincteric

SS - - Supra Sphincteric

ND - - Not Done

FE - - Fistulectomy

FO - - Fistulotomy

SE - - Seton

CNSIP - - Chronic Non Specific Inflammatory Pathology

TB - -Tuberculosis